Honolulu High-Capacity Transit Corridor Project
Alternatives Analysis

Transportation Impacts Results Report

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Prepared for:
City and County of Honolulu

Prepared by:
Kaku Associates, Inc.
Parsons Brinckerhoff Quade & Douglas, Inc.

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Acronyms Used in this Document

AA	Alternatives Analysis
DBEDT	Department of Business, Economic Development and Tourism
DTS	Department of Transportation Services
FTA	Federal Transit Administration
HDOT	Hawai‘i Department of Transportation
HOV	High Occupancy Vehicle
LOS	Level-of-Service
LOTMA	Leeward O‘ahu Transportation Management Association
NEPA	National Environmental Policy Act
OMPO	O‘ahu Metropolitan Planning Organization
ORTP	O‘ahu Regional Transportation Plan
OTS	O‘ahu Transit Services, Inc.
PUC	Primary Urban Center
TAA	Transportation Analysis Area
TDM	Transportation Demand Management
TSM	Transportation System Management
UH	University of Hawai‘i
V/C	Volume-to-Capacity Ratio
VHD	Vehicle Hours of Delay
VHT	Vehicle Hours Traveled
VMT	Vehicle Miles Traveled

Chapter 1 Introduction

This report discusses the existing and future (planning horizon year 2030) transportation system conditions, service characteristics, performance, and transportation impacts for each of the Honolulu High-Capacity Transit Corridor Project alternatives. The report first presents the existing transportation conditions, an evaluation of the performance of the current system, and existing travel demand patterns. The performance of the future alternatives is then compared in terms of transit performance, roadway impacts, non-motorized traffic impacts, and construction impacts. Finally, a summary highlighting key differences among the alternatives is presented.

This chapter introduces the project and this report. It begins with a brief orientation to the corridor and the alternatives and then describes the travel forecasting methods, inputs to the model, and the reliability of the model.

Chapter 2 of this report describes the existing transportation system. The following chapters evaluate the various project alternatives in terms of potential impacts on the transportation system, including impacts on transportation demand and travel patterns on the island of O‘ahu, impacts on transit service, roadway system operational impacts, and other transportation system impacts (such as physical impacts on roadways, impacts on parking and the non-motorized transportation system, freight movement, and potential transportation system impacts during construction).

Corridor Description

The study corridor extends from Kapolei in the west (Wai‘anae or ‘Ewa direction) to the University of Hawai‘i at Mānoa (UH Mānoa) in the east (Koko Head direction), and is confined by the Wai‘anae and Ko‘olau Mountain Ranges to the north (mauka direction) and the Pacific Ocean to the south (makai direction). Between Pearl City and ‘Aiea, the corridor's width is less than one mile between the Pacific Ocean and the base of the Ko‘olau Mountains.

The General Plan for the City and County of Honolulu directs future population and employment growth to the ‘Ewa and Primary Urban Center Development Plan areas and the Central O‘ahu Sustainable Communities Plan area. The largest increases in population and employment are projected in the ‘Ewa, Waipahu, Downtown, and Kaka‘ako districts, which are all located in the corridor (Figure 1-1).

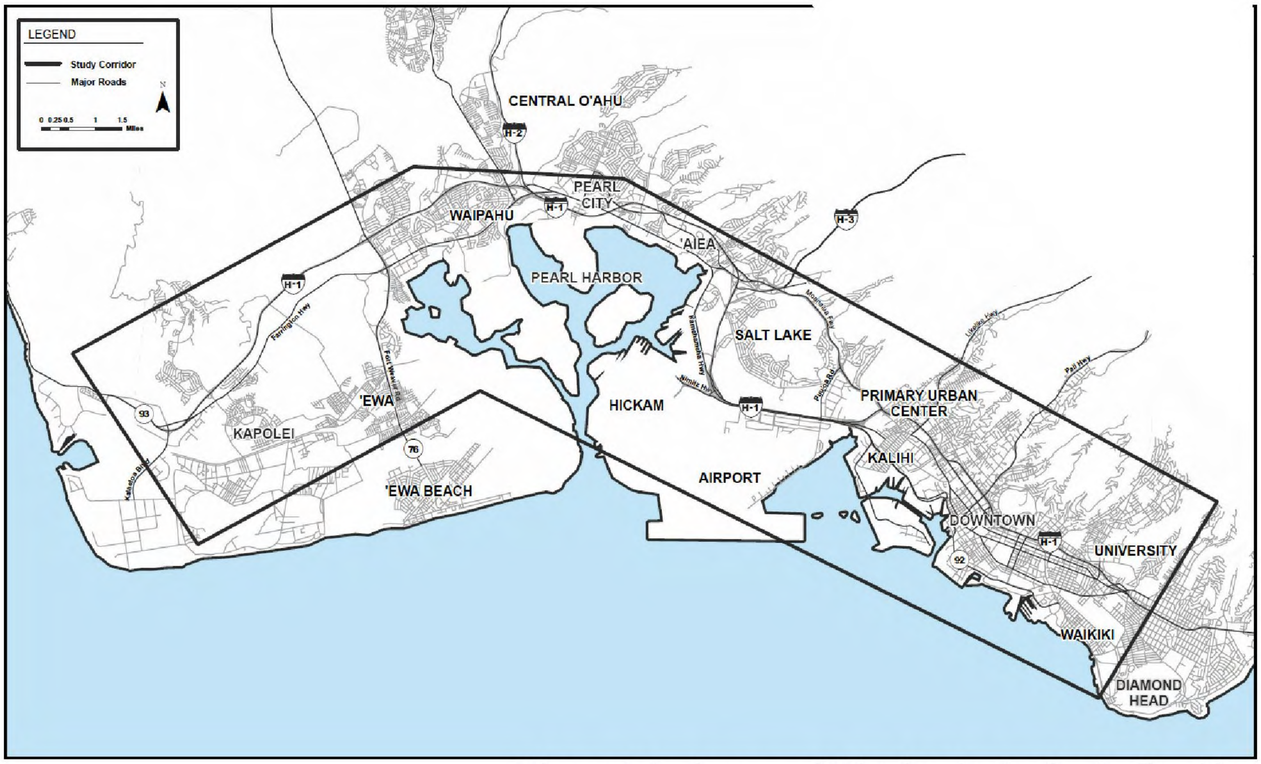


Figure 1-1. Areas and Districts in the Study Corridor

Currently, 63 percent of the population of 876,200 and 81 percent of the employment of 499,000 on O‘ahu are located within the study corridor. By 2030 this distribution would increase to 69 percent of the population and 84 percent of the employment as development continues to be concentrated into the Primary Urban Center (PUC) and ‘Ewa Development Plan areas.

Kapolei is the center of the ‘Ewa Development Plan area and has been designated O‘ahu’s “second city.” City and State government offices have opened in Kapolei and the University of Hawai‘i is developing a master plan for a new West O‘ahu campus there. The Kalaeloa Community Development District (formerly known as Barbers Point Naval Air Station) covers 3,700 acres adjacent to Kapolei and is planned for redevelopment. The Department of Hawaiian Home Lands is also a major landowner in the area and has plans for residential and retail development. In addition, developers have several proposals to continue the construction of residential subdivisions.

Continuing Koko Head, the corridor follows Farrington and Kamehameha Highways through a mixture of low-density commercial and residential development. This part of the corridor passes through the makai portion of the Central O‘ahu Sustainable Communities Plan area.

Farther Koko Head, the corridor enters the Primary Urban Center Development Plan area, which is bounded by commercial and residential densities that begin to increase in the vicinity of Aloha Stadium. The Pearl Harbor Naval Reserve, Hickam Air Force Base, and Honolulu International Airport border the corridor on the makai side. Military and civilian housing are the dominant land uses mauka of Interstate Route H-1 (the H-1 Freeway), with a concentration of high-density housing along Salt Lake Boulevard.

As the corridor continues Koko Head across Moanalua Stream, the land use becomes increasingly dense. Industrial and port land uses dominate along the harbor, shifting to primarily commercial uses along Dillingham Boulevard, a mixture of residential and commercial uses along North King Street, and primarily residential use mauka of the H-1 Freeway.

Koko Head of Nuʻuanu Stream, the corridor continues through Chinatown and Downtown. The Chinatown and Downtown areas, with 62,300 jobs, have the highest employment density in the corridor. The Kakaʻako and Ala Moana neighborhoods, comprised historically of low-rise industrial and commercial uses, are being revitalized with several high-rise residential towers currently under construction. Ala Moana Center, both a major transit hub and shopping destination, is served by more than 2,000 weekday bus trips and visited by more than 56 million shoppers annually.

The corridor continues to Waikīkī and through the McCully neighborhood to the University of Hawaiʻi. Today, Waikīkī has more than 20,000 residents and provides more than 44,000 jobs. It is one of the densest tourist areas in the world, serving approximately 72,000 visitors daily (DBEDT, 2003). UH Mānoa is the other major destination at the Koko Head end of the corridor. It has an enrollment of more than 20,000 students and approximately 6,000 staff (UH, 2005). Approximately 60 percent of students do not live within walking distance of campus (UH, 2002) and must travel by private vehicle or transit to attend classes.

The vast majority of trips made on the island occur within the study corridor. Currently, morning travel patterns in the corridor are heavily directional. Morning town-bound (Koko Head direction) traffic volumes through the Waipahu and ʻAiea areas are more than twice the volume traveling in the ʻEwa direction. Afternoon flows are less directional with ʻEwa-bound traffic volumes about 50 percent greater than town-bound (Koko Head-bound) traffic.

Alternatives Considered

Four alternatives are evaluated for the Alternatives Analysis (AA) for this project. They were developed through a screening process that considered alternatives identified through previous transit studies, a field review of the study corridor, an analysis of current housing and employment data for the corridor, a literature review of technology modes, work completed by the Oʻahu Metropolitan Planning Organization (OMPO) for its *2030 Oʻahu Regional Transportation Plan* (2006), and public and agency comments received during a formal project scoping process held in accordance with the requirements of the National Environmental Policy Act (NEPA) and the Hawaiʻi Environmental Impact Statement Law (Chapter 343). The four alternatives are described in detail in the *Honolulu High-Capacity Transit Corridor Project Alternatives Analysis*

*Detailed Definition of Alternatives Report (*DTS, 2006a), which is included as Appendix A of the AA. The alternatives evaluated are as follows:

- No Build Alternative
- Transportation System Management Alternative
- Managed Lane Alternative
- Fixed Guideway Alternative.

Alternative 1: No Build

The No Build Alternative includes existing transit and highway facilities and committed transportation projects anticipated to be operational by 2030. Committed transportation projects are those programmed in the *2030 O'ahu Regional Transportation Plan* prepared by OMPO (OMPO, 2006). The committed highway elements of the No Build Alternative are also included in the build alternatives.

The No Build Alternative's transit component would include an increase in fleet size to accommodate the anticipated growth in population, while allowing service frequencies to remain the same as today. Bus fleet requirements are listed in Table 1-1.

Table 1-1. Transit Vehicle Requirements

Alternative	Bus		Fixed Guideway	
	Peak	**Fleet**	**Peak**	**Fleet**
2005 Existing Conditions				
Existing Conditions	409	525	0	0
Alternative 1: 2030 No Build				
No Build Alternative	511	614	0	0
Alternative 2: 2030 Transportation System Management				
TSM Alternative	638	765	0	0
Alternative 3: 2030 Managed Lane				
Two-Direction Option	705	846	0	0
Reversible Option	755	906	0	0
Alternative 4: 2030 Fixed Guideway				
Kalaeloa – Salt Lake – North King – Hotel	441	529	72	90
Kamokila – Airport – Dillingham – King with a Waikīkī Branch	435	522	68	90
Kalaeloa – Airport – Dillingham – Halekauwila	448	540	74	90
20-mile Alignment East Kapolei to Ala Moana Center	497	596	54	70

Alternative 2: Transportation System Management

The Transportation System Management (TSM) Alternative would provide an enhanced bus system based on a hub-and-spoke route network, conversion of the present a.m. peak-hour-only zipper-lane to both a morning and afternoon peak-hour zipper-lane operation, and relatively low-cost capital improvements on selected roadway facilities to give priority to buses. Bus fleet requirements are listed in Table 1-1. The TSM Alternative includes the same committed highway projects as assumed for the No Build Alternative.

Alternative 3: Managed Lane

The Managed Lane Alternative would include construction of a two-lane, grade-separated facility between Waipahu and Downtown Honolulu (Figure 1-2 and Figure 1-3) for use by buses, paratransit vehicles, and vanpool vehicles. The managed lane facility would integrate with the Hawai‘i Department of Transportation’s (HDOT’s) proposed Nimitz Flyover project that is included in the *2030 O‘ahu Regional Transportation Plan* (OMPO, 2006). High-occupancy vehicles (HOV) and toll-paying, single-occupant vehicles also would be allowed to use the facility provided that sufficient capacity would be available to maintain free-flow speeds for buses and the above-noted paratransit and vanpool vehicles. Variable pricing strategies for single-occupant vehicles would be implemented to maintain free-flow speeds for transit and HOVs. Two design and operational variations of the Managed Lane Alternative are evaluated: a Two-direction Option (one lane in each direction) and a two-lane Reversible Option. For both options, access to the facility in West O‘ahu would be via ramps from the H-1 and H-2 Freeways just prior to the Waiawa Interchange. Both options would require modification to the Nimitz Flyover project’s design and would terminate with ramps tying into Nimitz Highway at Pacific Street. The H-1 zipper lane would be maintained in the Two-direction Option but discontinued in the Reversible Option.

An intermediate bus access point would be provided in the vicinity of Aloha Stadium. Bus service using the managed lane facility would be restructured and enhanced, providing additional service between Kapolei and other points ‘Ewa of the Primary Urban Center, and Downtown Honolulu and UH Mānoa.

Alternative 4: Fixed Guideway

The Fixed Guideway Alternative would include the construction and operation of a fixed-guideway transit system between Kapolei and UH Mānoa. The system could use any of a range of fixed-guideway transit technologies that meet performance requirements, and could either be automated or employ drivers.

The study corridor for the Fixed Guideway Alternative is evaluated in five sections to simplify the analysis and impact evaluation in this AA (Figure 1-4 through Figure 1-8**).** Detailed alignment drawings are available in the *Honolulu High-Capacity Transit Corridor Project Alignment Plans and Profiles* (DTS, 2006f). Each alignment has distinctive characteristics and environmental impacts and provides different service options. Therefore, each alignment is evaluated individually and compared to the other alignments in that section. The sections, the alignments within each section, and the number of stations considered for each alignment are listed in Table 1-2.

Station and supporting facility locations also are considered. Supporting facilities include a vehicle maintenance facility and park-and-ride lots. Some bus service would be reconfigured to bring riders on local buses to nearby fixed-guideway transit stations. To support this system, the bus fleet would increase, as shown in Table 1-1.

Although this alternative would be designed to be within existing street or highway rights-of-way as much as possible, property acquisition at various locations would be required. Future extensions of the system to Central O‘ahu, East Honolulu, or within the corridor are possible but are not being addressed in detail in the AA.

Table 1-2. Fixed Guideway Alternative Analysis Sections and Alignments

Section	Alignments Being Considered	Number of Stations
I. Kapolei to Fort Weaver Road	Kamokila Boulevard/Farrington Highway	5
	Kapolei Parkway/North-South Road	6
	Saratoga Avenue/North-South Road	8
	Geiger Road/Fort Weaver Road	7
II. Fort Weaver Road to Aloha Stadium	Farrington Highway/Kamehameha Highway	5
III. Aloha Stadium to Middle Street	Salt Lake Boulevard	2
	Mauka of the Airport Viaduct	3
	Makai of the Airport Viaduct	4
	Aolele Street	4
IV. Middle Street to Iwilei	North King Street	2
	Dillingham Boulevard	3
V. Iwilei to UH Mānoa	Beretania Street/South King Street	8
	Hotel Street/Kawaiaha‘o Street/Kapi‘olani Boulevard	12
	King Street/Waimanu Street/Kapi‘olani Boulevard	9
	Nimitz Highway/Queen Street/Kapi‘olani Boulevard	10
	Nimitz Highway/Halekauwila Street/ Kapi‘olani Boulevard	10
	Waikīkī Branch	3

Combination of Fixed Guideway Alternative Alignment Options

For ease of comparison of Alternatives 1 through 3, three alignment combinations are presented in the AA. The combinations were selected considering initial information about the performance of the various alignment options in each of the corridor sections. While the presented combinations include the alignments with the best performance characteristics in each section, they do not preclude a different combination of alignments from being selected. The three combinations presented are as follows:

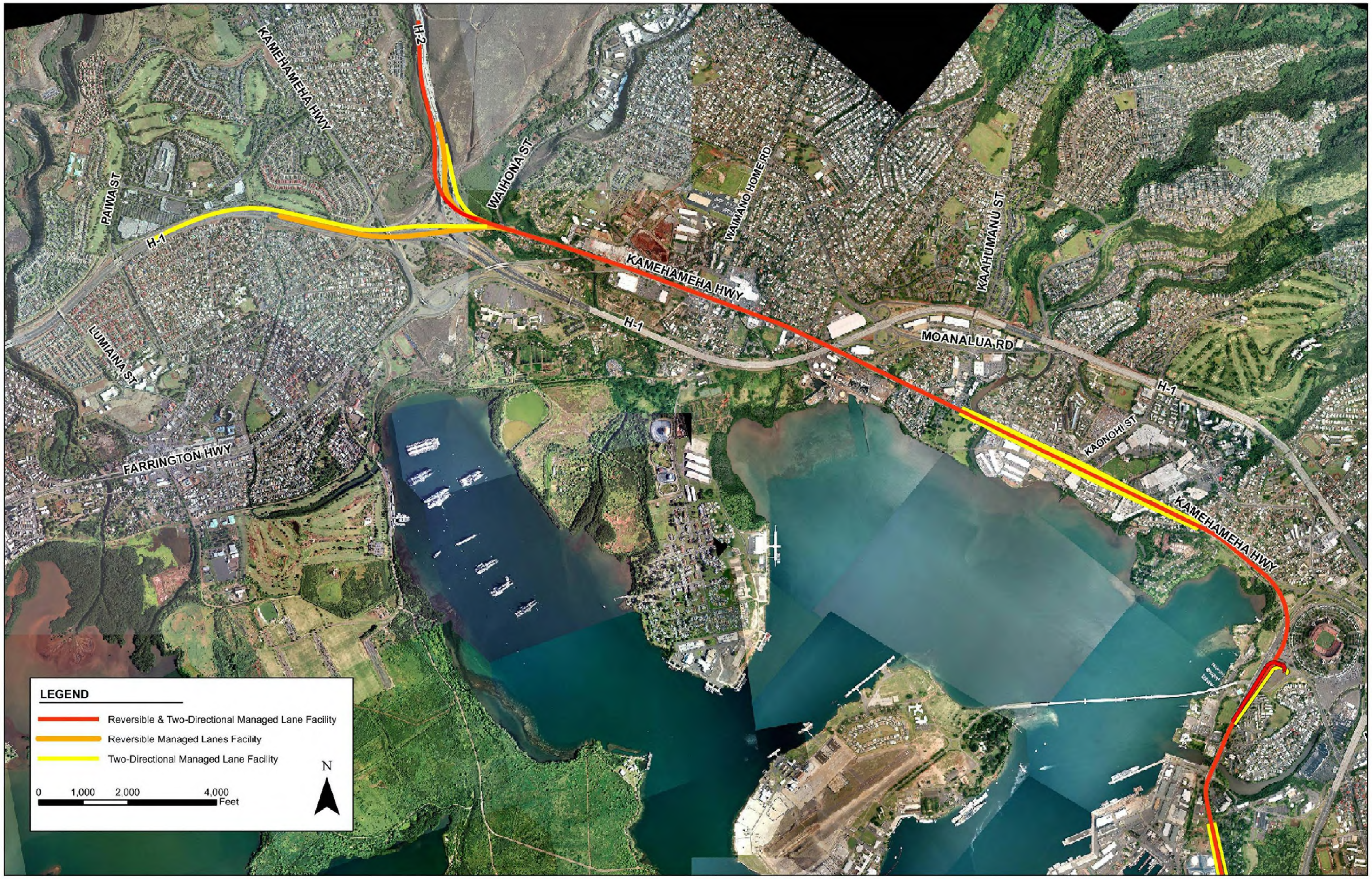


Figure 1-2. Managed Lane Alternative ('Ewa Section)

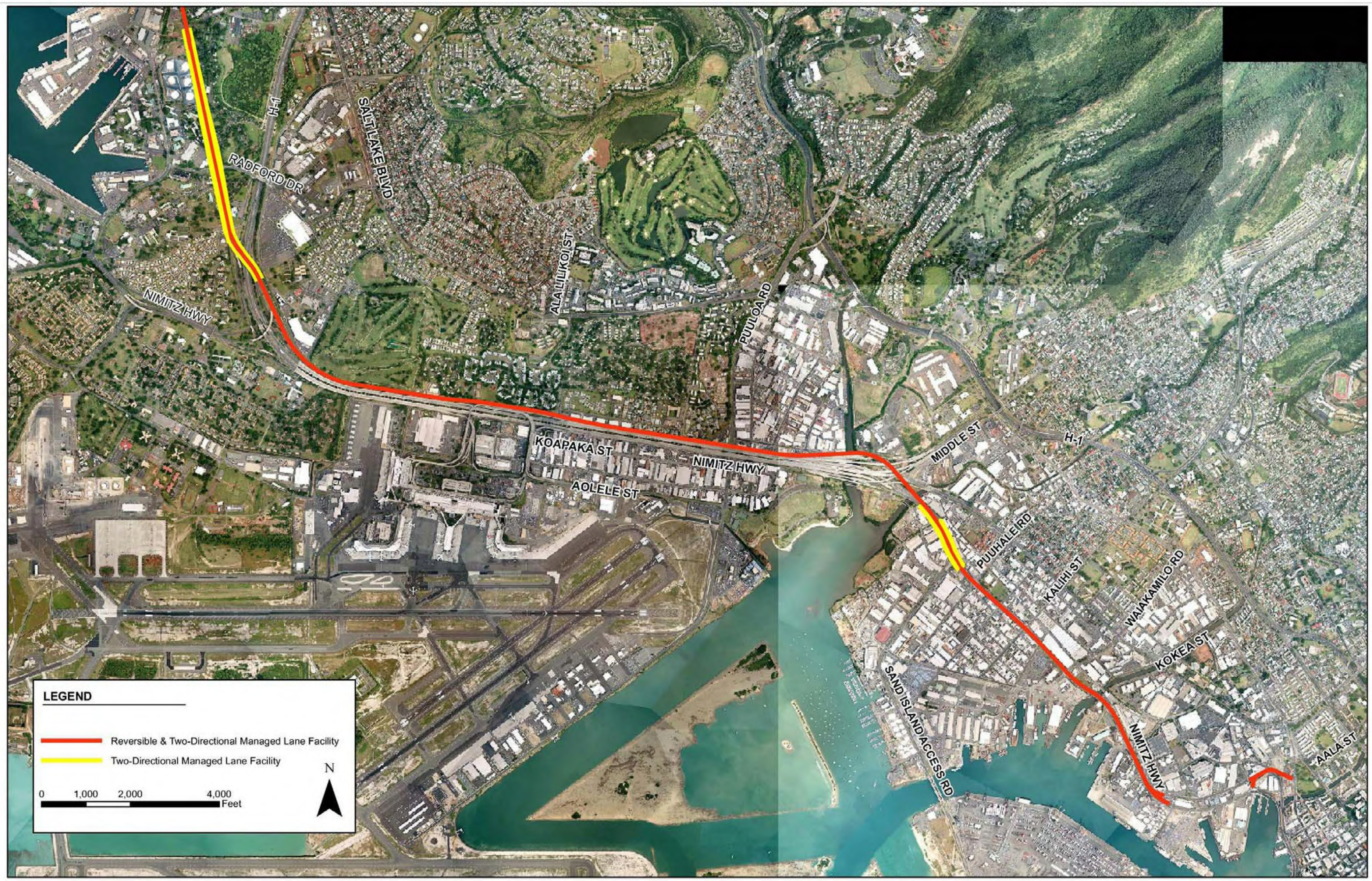


Figure 1-3. Managed Lane Alternative (Koko Head Section)

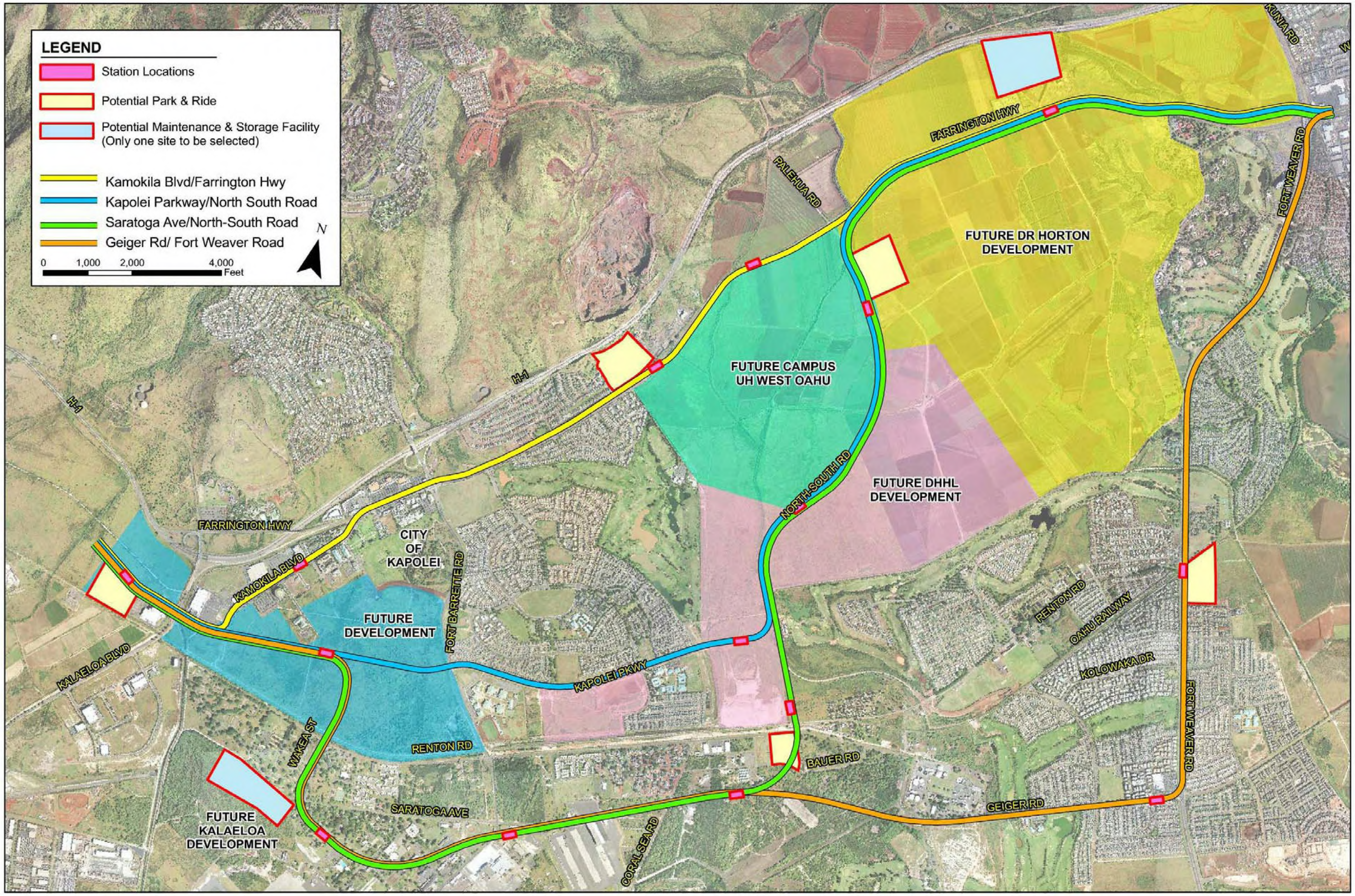


Figure 1-4. Fixed Guideway Alternative Section I

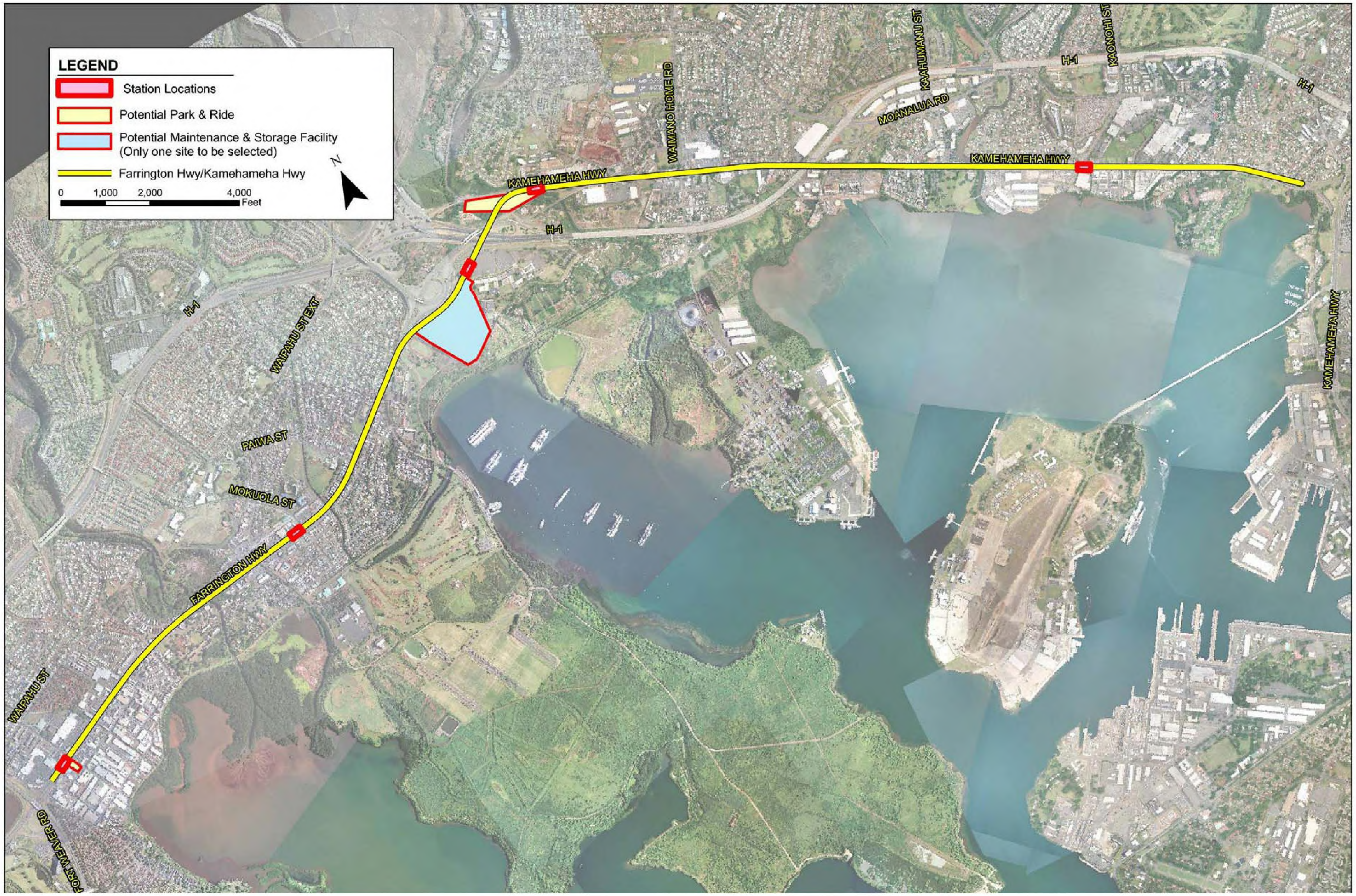


Figure 1-5. Fixed Guideway Alternative Section II

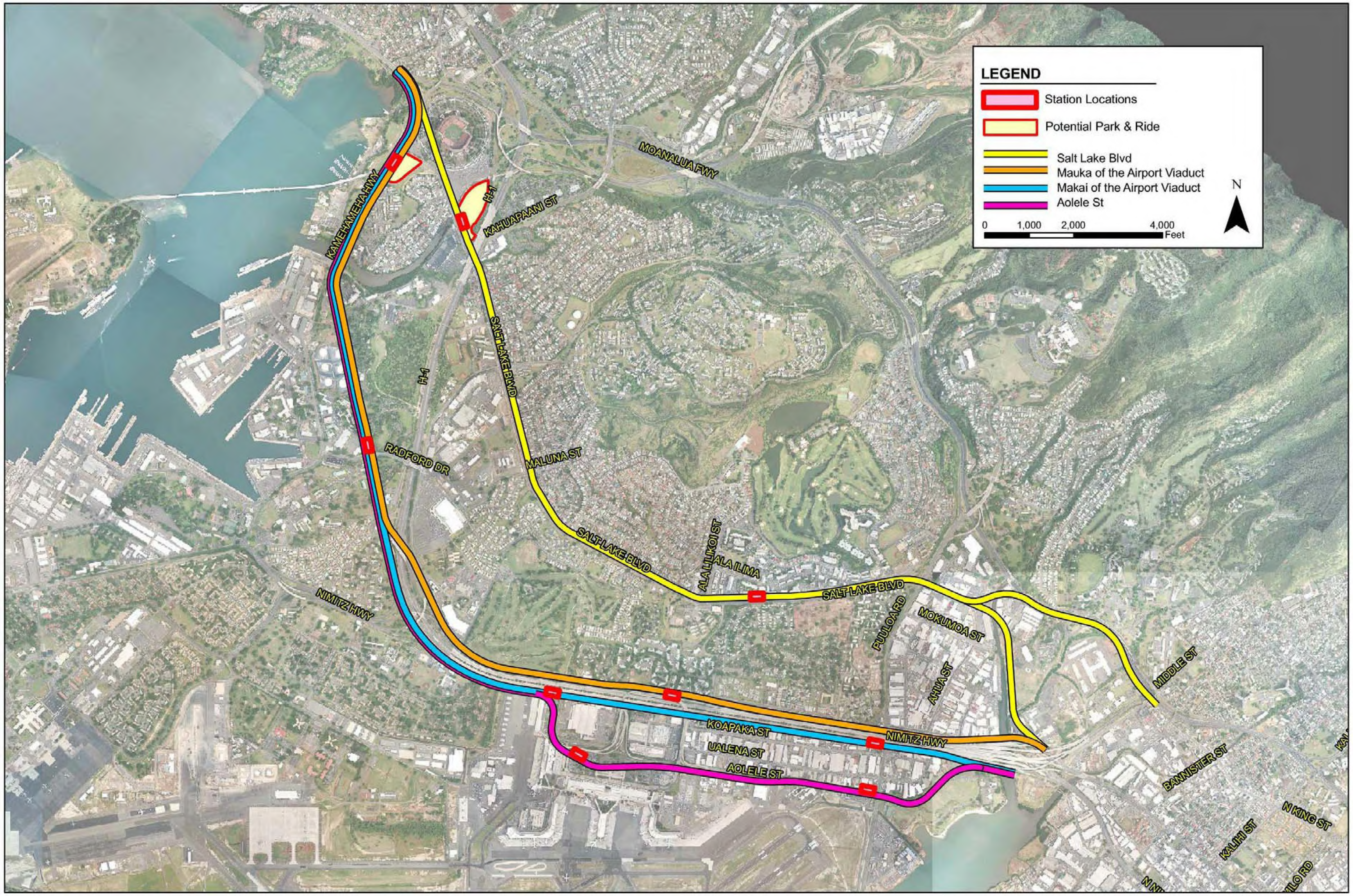


Figure 1-6. Fixed Guideway Alternative Section III

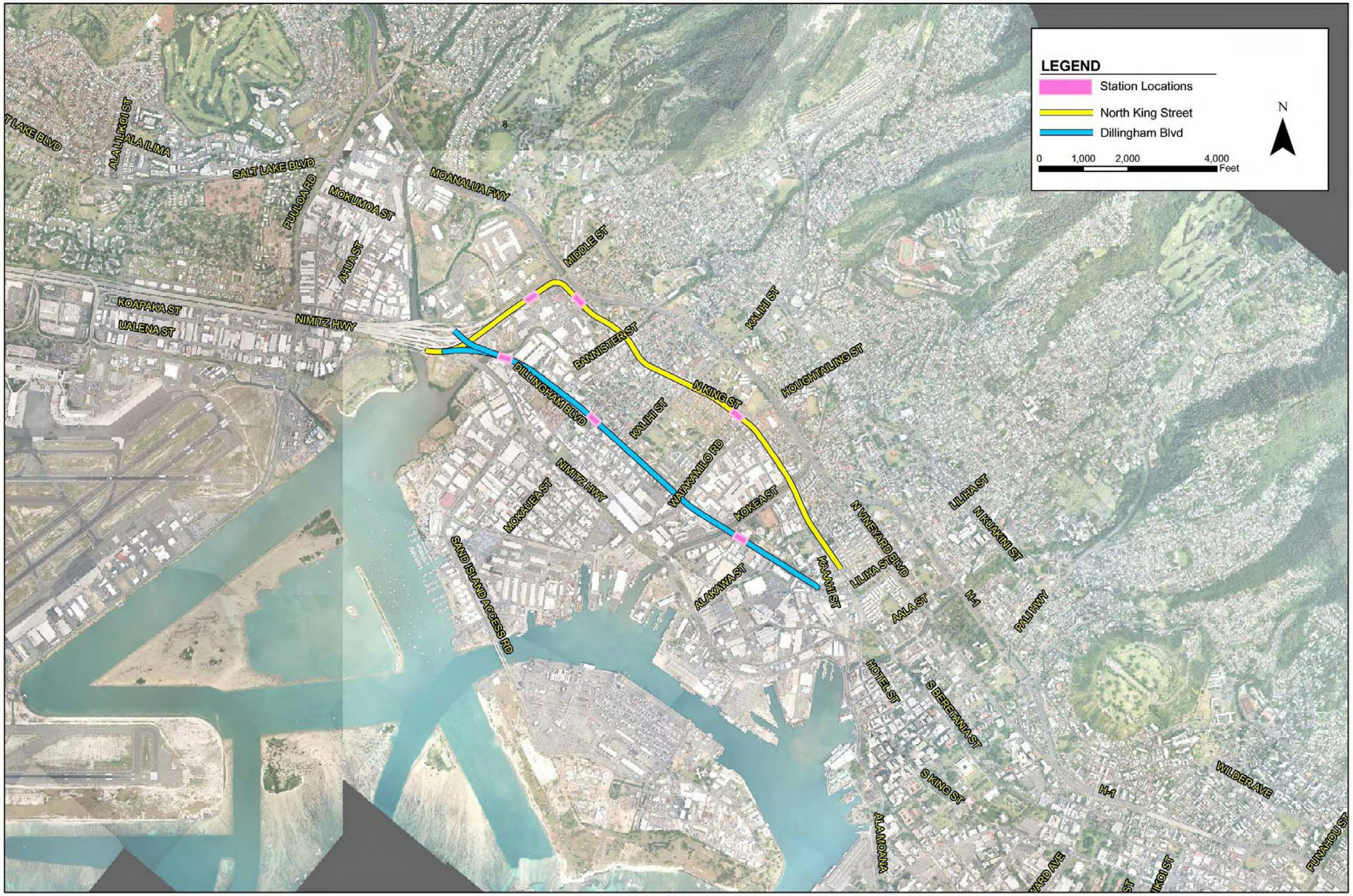


Figure 1-7. Fixed Guideway Alternative Section IV

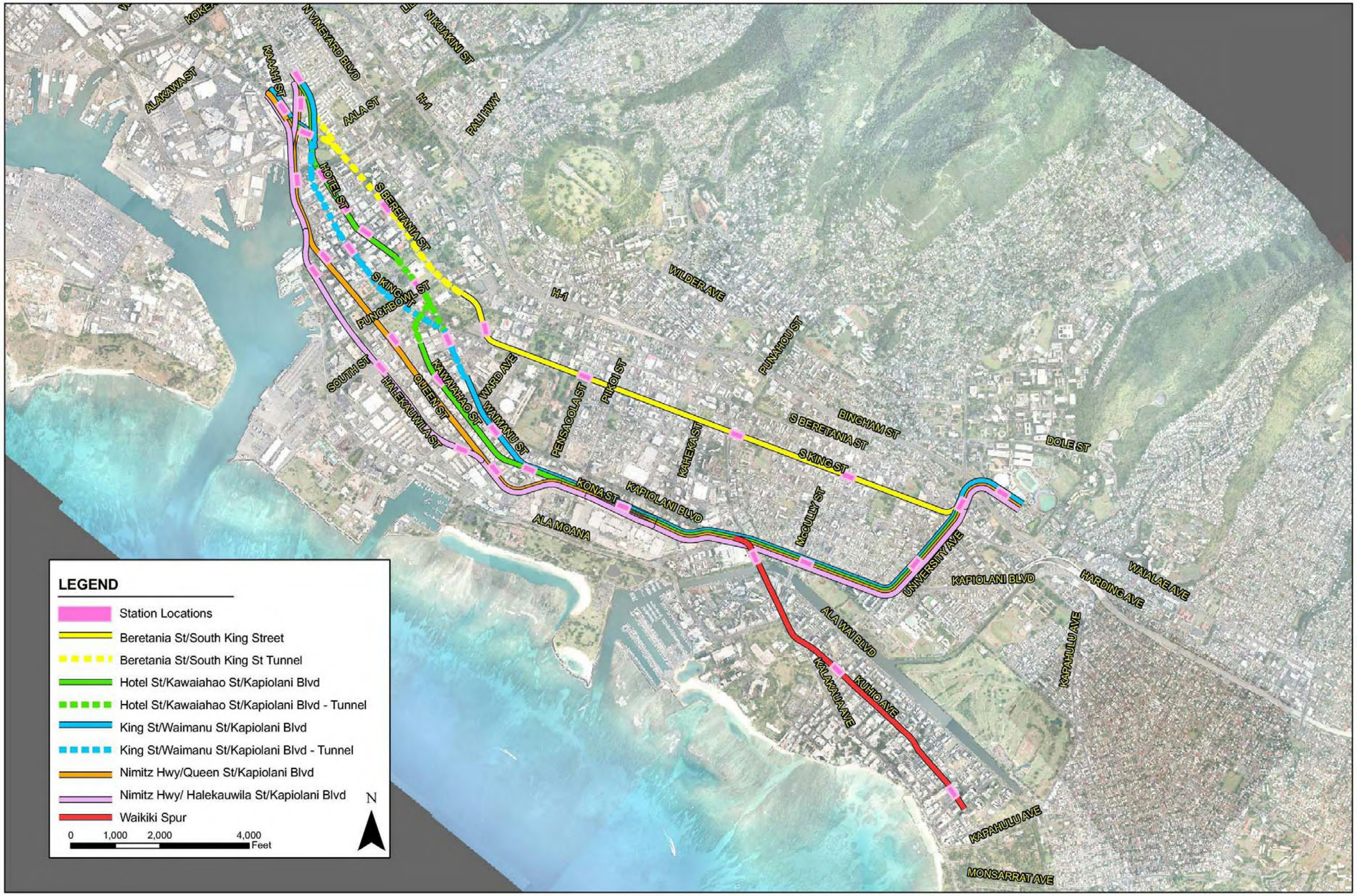


Figure 1-8. Fixed Guideway Alternative Section V

- Combination 1: Kalaeloa – Salt Lake – North King – Hotel. This combination would link the following series of alignments through the study corridor: Saratoga Avenue/North-South Road to Farrington Highway/Kamehameha Highway to Salt Lake Boulevard to North King Street to Hotel Street/Kawaiaha‘o Street/Kapi‘olani Boulevard.
- Combination 2: Kamokila – Airport – Dillingham – King with a Waikīkī Branch. This combination would link the following series of alignments through the study corridor: Kamokila Boulevard/Farrington Highway to Farrington Highway/ Kamehameha Highway to Aolele Street to Dillingham Boulevard to King Street/Waimanu Street/Kapi‘olani Boulevard with a Waikīkī Branch.
- Combination 3: Kalaeloa – Airport – Dillingham – Halekauwila. This combination would link the following series of alignments through the study corridor: Saratoga Avenue/North-South Road to Farrington Highway/Kamehameha Highway to Aolele Street to Dillingham Boulevard to Nimitz Highway/Halekauwila Street/Kapi‘olani Boulevard.

20-mile Alignment

To provide an alternative with lower cost than the Full-corridor Alignments listed above, a 20-mile Alignment was identified for evaluation. The 20-mile Alignment provides a substantial benefit to users with a lower capital cost.

The 20-mile Alignment includes the portion of the guideway alignments discussed above that would begin makai of UH West O‘ahu and continue to Ala Moana Center. In its entirety, the 20-mile Alignment would begin at one station makai of UH West O‘ahu near Kapolei Parkway and North-South Road. The alignment would include a design variation to serve UH West O‘ahu and cross D.R. Horton land to Farrington Highway then continue Koko Head following Kamehameha Highway to Aolele Street and Dillingham Boulevard, and then continue elevated following Nimitz Highway and Halekauwila Street to Ala Moana Center.

Travel Demand Forecasting Model

Travel Forecasting Methodology Summary

The primary quantitative method for evaluating the alternatives is through a travel forecasting model. The basis for this project’s travel forecasting model is OMPO’s model that was used for the 2030 O’ahu Regional Transportation Plan (ORTP). This model is based on “best-practice” models developed for urban travel modes in the United States. The modeling approach has proven successful over the past several decades. All model sets developed recently in several urban areas have used the "sequential" approach to travel forecasting in which travel patterns are assumed to be the product of a sequence of individual decisions:

- The number of trips that a household will make – “trip generation”
- The destinations of these trips – “trip distribution”
- The modes that will be used for travel – “mode choice”

- The paths on the network that the trips will take – "network assignment."

For the purpose of this project, the current OMPO model was refined and augmented to better represent transit alternatives in the corridor. The refinements occurred in three parts. First, the existing models were reviewed, enhanced, recalibrated, and validated using existing calibration datasets consistent with current Federal Transit Administration (FTA) guidelines. Second and concurrently, a new on-board transit survey was completed. Third, the mode choice model was recalibrated and validated using data from the new on-board survey.

Model updates were reviewed and calibrated against the current on-board survey results to ensure an accurate network representation. Results from the model were analyzed using FTA's SUMMIT software to calculate the transportation system user benefit and identify areas that benefit from the alternative and areas that experience detriment from the alternative.

Additional details of the methodology, input, and model coding are documented in the *Honolulu High-Capacity Transit Corridor Project Travel Forecasting Methodology Report* (DTS, 2006x).

Travel Model Inputs

Preparation of the Honolulu High-Capacity Transit Corridor Project model required general assumptions and specific input details. The general assumptions were consistent with those used by OMPO for the 2030 ORTP and included projections and policies regarding land use, the highway network, transit service policies, fare and pricing structures, and transit capacity. These assumptions were held consistent throughout the modeling of the baseline and build alternatives.

A new component was added to the model to represent the tolling features of the Managed Lane Alternative. It created a toll-road option with a specific pricing structure as an option for travel that was used in the Managed Lane Alternative model. The option allowed the simulation to allocate vehicles to the toll-road in varying volumes depending on the amount charged for the toll. This component was tested and implemented as a Toll Choice Component of the Mode Choice Model.

The component of the model that controls the speed assignment was revised to create a more realistic representation of the roadway travel speeds given traffic volumes. The function is called the volume-delay function, and it provides a basis for travel speeds depending on the density of traffic traveling on a given road. The component was updated to provide a more realistic representation of travel speeds as the road approaches and exceeds its designated capacity. As a road reaches capacity, the travel speeds decrease relative to density. The new component provided a better estimation of speed variation in relation to the traffic density.

In addition to updating the congested roadway speeds, the arterial free-flow speeds were updated. The updated data were based on speed surveys that were conducted to verify the accuracy of the arterial speeds coded in the OMPO model. The survey concluded that the existing model rates were five to 15 mph faster than actual rates for free-flow conditions. Therefore, the project model reflected slower free-flow speeds for certain arterial routes in Pālama, Chinatown, Downtown, Kaka‘ako, Ala Moana, Waikīkī, Makiki, McCully, and Mo‘ili‘ili.

Verification and validation of other model components were made based on several items: Year 2000 Census Transportation Planning Package Person Trip Matrix; a review of the transit travel time functions; a review of current parking costs and policies; and a recalibration of the mode choice model and model structure. These resulted in minor adjustments and verified the results generated from the model.

The details regarding the adjustments and changes described in the paragraphs above are documented in Appendix B of the *Honolulu High-Capacity Transit Corridor Project Travel Forecasting Methodology Report* (DTS, 2006x).

Reliability of Forecasts

The study team has identified and assessed potential risks associated with the transportation analysis and has taken a number of measures to minimize them. The primary risk relates to the accuracy of the ridership forecasts. The level of projected ridership is key to whether a proposed project is viable from both a financial and political perspective. A commonly considered risk is that the projected levels of ridership will not be reached in reality. Factors that can influence this include the robustness of the travel demand forecasting process and the accuracy of the data input into the model – particularly the land use projections of future population and employment. The study team has considered both of these factors and has taken the following steps to minimize their risk:

- The travel demand forecasting model has been reviewed and updated for use on the project. This includes incorporating guidelines and standards mandated by the FTA that have been implemented to produce reasonable and conservative ridership forecasts. One critical component of the model that was updated was the mode choice sub-model, which estimates which mode travelers will choose to make a given trip in the future. The revision of the model and the resulting forecast methodology have been reviewed and approved by FTA.
- A comprehensive on-board transit survey was undertaken covering the entire TheBus system in order to obtain the most up-to-date information on how many people are currently using transit on O’ahu, who they are, and why they use it. This information is critical in assessing future use of transit on the island.
- The population and employment forecasts for O’ahu are official OMPO projections. These forecasts were reviewed and updated specifically for this project to make certain that the most recent data regarding development on the island are incorporated into the model.

After taking these steps, the biggest risk that could affect the accuracy of the ridership forecasts is the accuracy of the population and employment projections. Factors outside the control of the study team, such as a downturn in the economy, could affect whether the island will develop as planned.

Chapter 2 Existing Transportation Conditions

This section describes transportation facilities and services within the corridor. This includes highway and transit systems, parking facilities and availability, freight facilities, and pedestrian and bicycle facilities.

Existing Transportation System

Street and Highway System

Freeways, highways, and streets are the basic transportation network elements responsible for the movement of people and goods on O'ahu. The transportation network is used by all types of vehicles, public and private transit services, bicycles, and pedestrians. The roadway system on O'ahu is maintained by HDOT and the City and County of Honolulu Department of Facility Maintenance.

State Highway System

The State highway system includes all freeways and major highways connecting various parts of the island. The following description provides background information regarding the State highways maintained by HDOT. The State highway system is illustrated in Figure 2-1.

The interstate freeways on O'ahu are dedicated transportation structures. They are fully grade-separated, access-controlled structures with the sole purpose of facilitating the movement of people and goods to different parts of the island. Access to the interstate system is restricted to dedicated ramps, which minimize disruptions to the flow of traffic. This allows for higher operational speeds and improved capacity when compared to surface streets. The corridor is served primarily by the H-1 Freeway and the Moanalua Freeway (State Route 78), as indicated in Figure 2-1. The H-2 Freeway provides access to the corridor from Central O'ahu, and the H-3 Freeway provides access to the corridor from the Windward side.

Highways serve a purpose similar to that of the interstate system (i.e., facilitating the movement of goods and people to different parts of the island). Unlike the interstate system, highways are not fully grade-separated roadways. Rather, highways are major surface streets and expressways. Local traffic can access these facilities without the use of dedicated ramps; capacities and operational speeds are not as high as the interstate system. The State highway system consists of 280 route miles and 940 lane miles, including the freeway system. State highway facilities located within the project corridor include the following:

- The H-1 Freeway, Connection with Kalaniana'ole Highway in Wai'alae to connection with Farrington Highway in Makakilo

- The H-2 Freeway, Intersection with the H-1 Freeway at Waiawa Interchange to Wahiawā
- The H-3 Freeway, Marine Corps Base Hawaiʻi to Intersection with the H-1 Freeway at Hālawa Interchange
- Route 61, Pali Highway, Honolulu to Kailua
- Route 63, Likelike Highway, Kalihi to Intersection with Kamehameha Highway (Route 83) in Kāneʻohe
- Route 64, Sand Island Access Road
- Route 76, Fort Weaver Road, Intersection with the H-1 Freeway to ʻEwa Beach
- Route H201, Moanalua Freeway, Middle Street to Hālawa Interchange
- Route 80, Kamehameha Highway, Wahiawā to Intersection with Kamehameha Highway (Route 99)
- Route 83, Kamehameha Highway, Intersection with Pali Highway (Route 61) to Intersection with Kāneʻohe Bay Drive (Route 65)
- Route 92, Nimitz Highway, Pearl Harbor to Honolulu Harbor
- Route 92, Ala Moana Boulevard, Honolulu Harbor to Waikīkī
- Route 93, Farrington Highway, Waiawa Interchange to Mākua
- Route 95, Kalaeloa Boulevard, Intersection with the H-1 Freeway, Makakilo Interchange to Barbers Point Harbor
- Route 99, Kamehameha Highway, Schofield Barracks to Waialua
- Route 750, Kunia Road, Intersection with the H-1 Freeway to Schofield Barracks.

City and County Street System

The City and County of Honolulu's street system consists of those arterial facilities that are not in the State system, as well as local streets (Figure 2-2). Principal ʻEwa/Koko Head arteries located in the corridor include the following:

- Ala Wai Boulevard
- Beretania Street
- Dillingham Boulevard
- Kalākaua Avenue
- Kapiʻolani Boulevard
- King Street
- Kūhiō Avenue
- Moanalua Road
- Salt Lake Boulevard
- School Street.

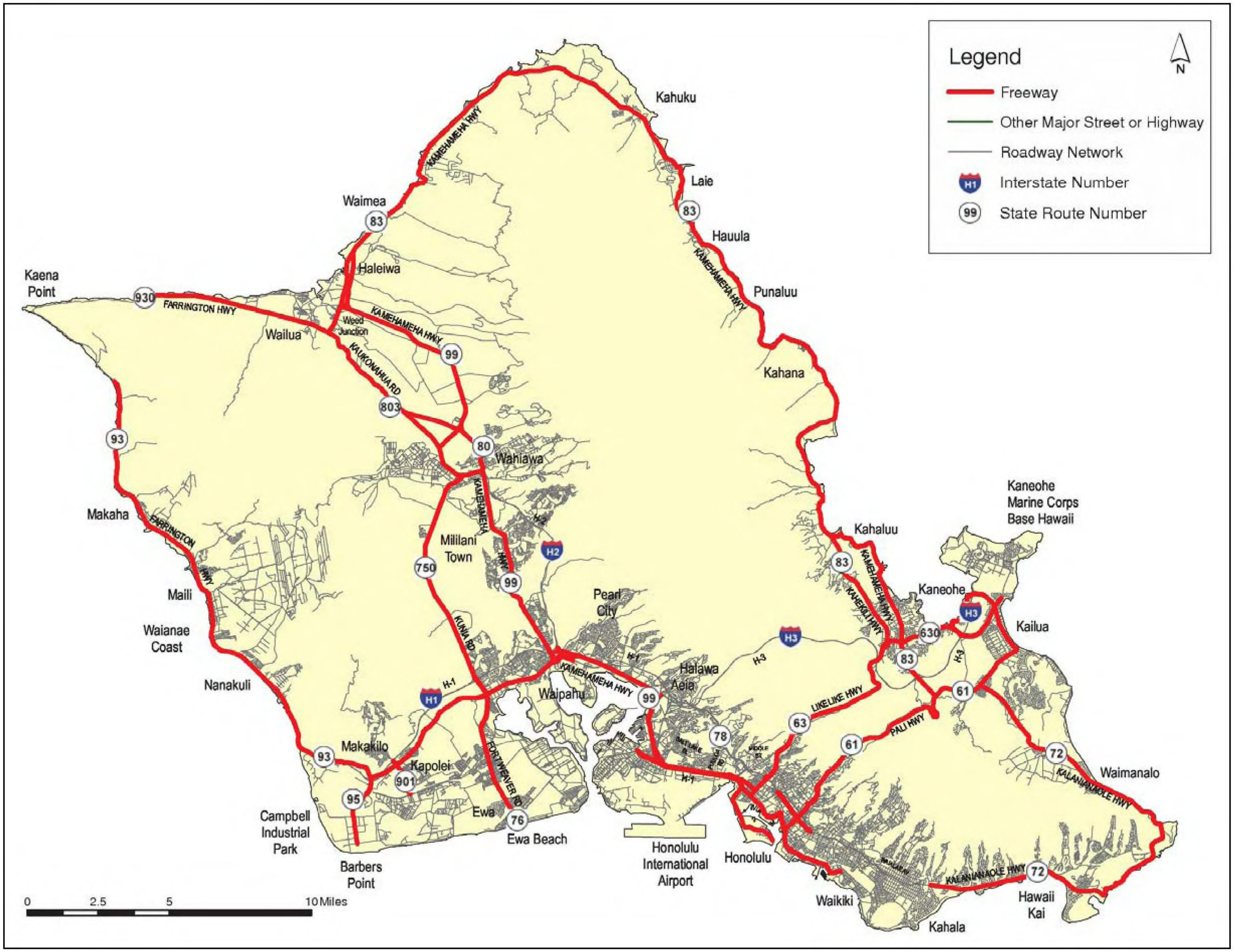


Figure 2-1. Existing State Highway System

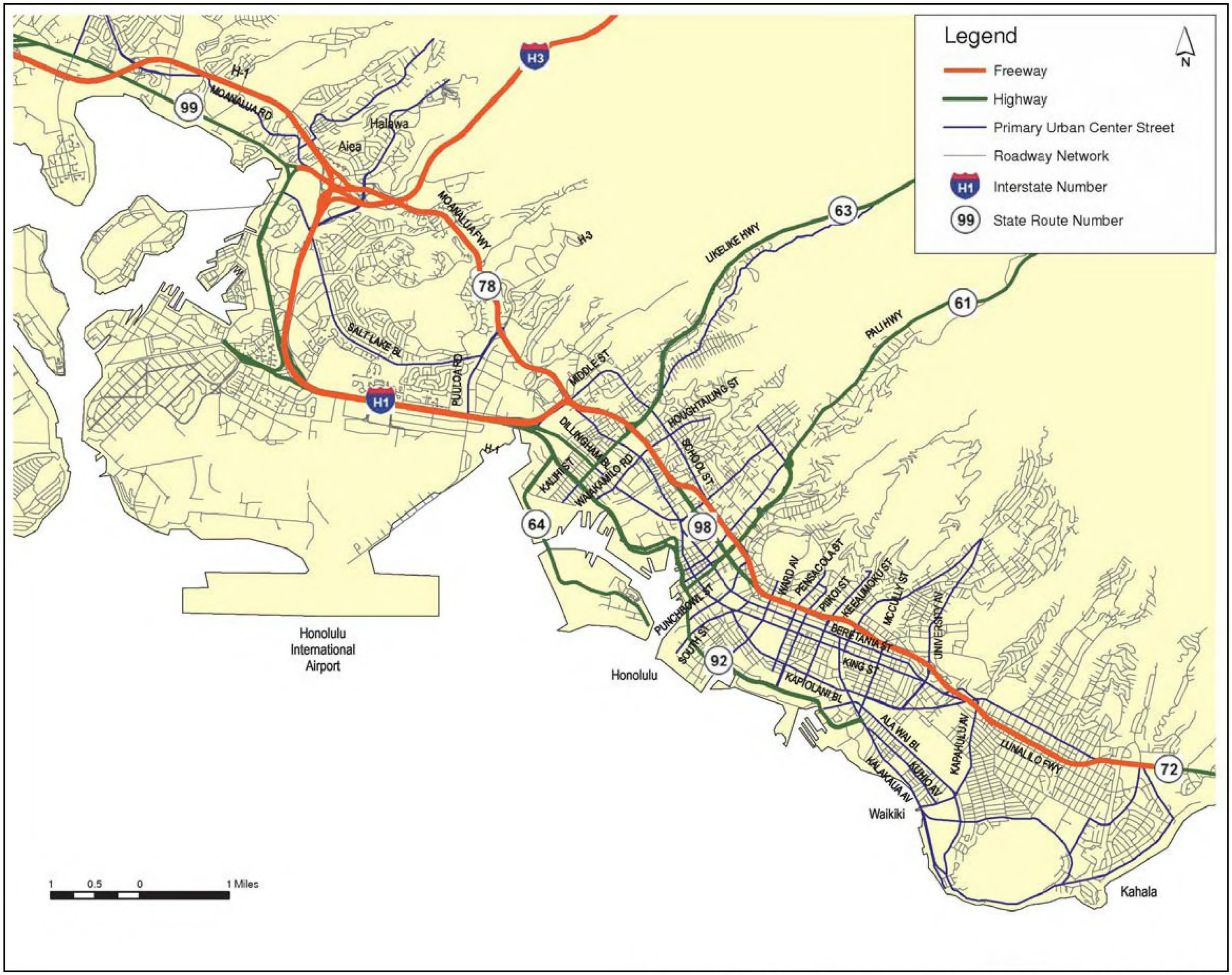


Figure 2-2. Existing Arterial Roadways in the Study Corridor

The main mauka/makai roadways in the corridor are as follows:

- Fort Weaver Road
- Houghtailing Street
- Kalākaua Avenue
- Kalihi Street
- Kapahulu Avenue
- Ke‘eaumoku Street
- McCully Street
- Middle Street
- Pensacola Street
- Pi‘ikoi Street
- Punchbowl Street
- Pu‘uloa Road
- South Street
- University Avenue
- Waiakamilo Road
- Ward Avenue.

Transportation Demand Management and Transportation Systems Management

Transportation Demand Management (TDM) is a general term referencing a variety of strategies to reduce highway travel demand. Transportation System Management (TSM) has a basic objective of creating a more efficient use of transportation facilities by improving the operation and management of vehicles and roads. Examples of TDM/TSM measures specific to the island of O‘ahu include contraflow operations, special traffic lanes, and HOV lanes; these measures are overseen either by HDOT or the City and County of Honolulu.

Contraflow Lanes

Contraflow lanes are a TSM strategy wherein a lane that typically provides vehicular travel in one direction is reversed during certain times of the day (e.g., a lane serving the off-peak direction is reversed so as to provide an additional travel lane in the peak direction).

Contraflow facilities operated by the State are restricted to buses, vanpools, and vehicles with two or more occupants. HDOT currently provides contraflow operations at the following locations within the study corridor during the morning peak period:

- <u>H-1 Zipper Lane</u>: The “zipper” contraflow lane provides an additional Koko Head direction lane from Managers Drive in Waipahu to the Pearl Harbor interchange during the morning peak period and is open to HOVs only
- <u>H-1 Shoulder Express Lane</u>: This lane provides a short Koko Head lane for HOV use only between the Pearl Harbor interchange and the Ke‘ehi interchange during the morning peak period
- <u>Nimitz Highway (Route 92)</u>: During the morning peak period, a Koko Head contraflow HOV lane extends between the Ke‘ehi interchange and Industrial Parkway.

The City and County of Honolulu also operates contraflow lanes along congested corridors during specific peak periods. Unlike HDOT contraflow operations, the City and County facilities do not have occupancy restrictions and operate during both the morning and afternoon peak periods. City and County locations with reversible lane operations include the following:

- Kapi‘olani Boulevard: from the H-1 Freeway near South King Street to ‘Ewa of Ward Avenue in the morning, and from Pensacola Street to McCully Street during the afternoon peak
- Ward Avenue: from Lunalilo Street to makai of South King Street during the morning peak period
- Atkinson Drive: from Kona Street to Kapi‘olani during the morning peak period.
- Wai‘alae Avenue
- Kalākaua Avenue: from Kapahulu Avenue to 8th Avenue during the afternoon peak.

High Occupancy Vehicle Operations

HOV lanes are freeway or surface street lanes designated for exclusive use by buses, carpools, and vanpools. HDOT operates HOV lanes on the following facilities during certain times of the day:

- H-1 Freeway
- H-2 Freeway
- Moanalua Freeway (Route 78)
- H-1 Zipper Lane and Shoulder Express Lane
- Nimitz Highway (Route 92).

In addition to the contraflow lanes and HOV facilities described above, the shoulder along a portion of the H-1 Freeway provides an additional travel lane during the morning peak period.

Public Transportation System

Public transportation plays an important role in O‘ahu’s transportation system. Such services provide an alternative to automobile travel and, by extension, benefit the island by aiding in the reduction of roadway congestion, air and noise pollution, and energy consumption. Public transit also offers mobility options to the elderly, the physically and mobility challenged, and persons who do not have access to an automobile.

TheBus

A private company, O‘ahu Transit Services, Inc. (OTS), operates the public transit system on the island of O‘ahu (TheBus). OTS is under contract to the City and County of Honolulu. TheBus system is a fixed-route public transit service. Since August 2000, TheBus has restructured to a “hub-and-spoke” network with the intent of improving accessibility, increasing ridership, providing an enhanced level of service, and serving increasing number of trips to destinations other than the PUC. Components of the restructured system are as follows:

- Community and Urban Trunk Routes: Trunk routes form spokes within the hub-and-spoke system and facilitate hub-to-hub connections. The limited-stop rapid bus routes A, B, and C are trunk routes.

- Community and Urban Circulators: Circulator routes also form spokes within the hub-and-spoke system and radiate from the hubs to provide local neighborhood service.
- Express Services: Express bus services also form spokes of the hub-and-spoke system, and direct, non-stop, hub-to-hub connections are facilitated by the express services.

Weekday transit service for most bus routes is provided between 5 a.m. and 10 p.m. The *Honolulu High-Capacity Transit Corridor Project Existing Bus Transit System Base Data Report* (DTS, 2006) summarizes the various lines of service and their respective headway ranges by service period. TheBus system provides 93 numbered buses serving urban, suburban, and rural areas throughout Oʻahu. As of 2006, TheBus has a fleet of 525 buses and approximately 4,200 bus stops on the island.

TheBus system carries approximately 68 million passengers who travel approximately 21.5 million miles per year. Data collected through on-board surveys in December 2005 and January 2006 indicate that the observed ridership is 236,600 average weekday boardings. Of this figure, 199,100 boardings were observed on local bus service, 8,300 boardings on peak-period express bus service, and 29,200 boardings on limited-stop rapid bus routes (Routes A, B, and C). These figures are only for TheBus system and do not include TheHandi-Van system.

An annual pass costs $440 for an adult and $220 for a youth. A monthly pass costs $40 for adults and $20 for youths. One-way fares are $2/$1 for an adult and youth, respectively. Senior citizens and individuals with disabilities pay $30 for an annual pass and $1 for a one-way fare with a reduced fare card or a valid Medicare card; a $5 monthly pass sticker is also available.

TheHandi-Van

TheHandi-Van is a curb-to-curb demand-based transportation system provided by OTS for those persons eligible for paratransit service under the guidelines established by the Americans with Disabilities Act. TheHandi-Van is not a fixed-route service, although the areas serviced are similar to those serviced by TheBus. TheHandi-Van fleet consists of 106 vehicles that include different types of vans that provide service to more than 13,000 eligible customers, performing more than 630,000 trips annually. The days and hours of operation are the same as those of TheBus. Fares are $2 one-way and advance reservations are required.

LOTMA Commuter Express

The Leeward Oʻahu Transportation Management Association (LOTMA) offers the LOTMA Commuter Express, a private commuter bus service. The LOTMA Commuter Express provides non-stop freeway express lane service between Central Oʻahu and Honolulu as an alternative to solo driving. This is a subscription-based service; financial support by local companies reduces the end-user subscription to $95 for an unlimited use monthly pass and $55 for a 20-trip monthly pass. Casual riders are accommodated on a space-available basis for $3.50 per one-way trip. Additionally, LOTMA sponsors carpooling and vanpooling programs and offers computerized ride-matching assistance.

HDOT Vanpool Program

HDOT currently operates a vanpool program, Vanpool Hawai‘i, through an outside contractor, VPSI, Inc. A vanpool is a group of four to 15 commuters sharing one vehicle during the commute to and from work. As of September 2006, there were 185 vanpools in operation on O‘ahu. This program offers the option of a full-sized 15-passenger van for $55 per seat per month (Vanpool) or a seven-passenger minivan or sport utility vehicle for $70 per seat per month (Cool Pool). All riders share the vehicle's fuel and parking costs, regardless of the vanpool option.

Transit Centers

Transit centers are points within TheBus's hub-and-spoke system; they offer locations for multimodal transfer and are intended to support the bus transit systems as well as alternate travel means. Currently on O‘ahu there are two existing transit centers and three in the plan, design, or construction phases; the locations are listed below and identified in Figure 2-3:

Existing Transit Centers

- Waipahu Transit Center in Waipahu, located at Hikimoe Street near the Waipahu Library
- Kapolei Transit Center in Kapolei, located at Kamokila Boulevard near the Kapolei Post Office.

Proposed Transit Centers

- Mililani Transit Center in Mililani, located on Meheula Parkway near the Town Center of Mililani
- Wahiawā Transit Center in Wahiawā, located on California Avenue near the Civic Center
- Wai‘anae Transit Center in Wai‘anae, located on Leihoku Street near the Wai‘anae Mall.

Park-and-Ride Lots

Park-and-ride lots are designed as an alternative for people wishing to travel the majority of their commute by public transit. They are similar in function to transit centers, in that transfers to other travel means are facilitated. Typical users include commuters who drive to the park-and-ride facility, park their vehicle, and use either transit or a vanpool to complete the journey. The four existing park-and-ride facilities on O‘ahu are listed below and their locations are illustrated in Figure 2-3:

- Hawai‘i Kai Park-and-Ride in Hawai‘i Kai, located on Keāhole Street near the Hawai‘i Kai Towne Center
- Mililani Park-and-Ride in Mililani Mauka, located on Ukuwai Street near the Mililani Mauka District Park

- Wahiawā Park-and-Ride in Wahiawā, located in Leilehua Golf Course Road near the Wahiawā Armory
- Royal Kunia Park-and-Ride in Waipahu, located on Kupuna Loop near the Kunia Interchange.

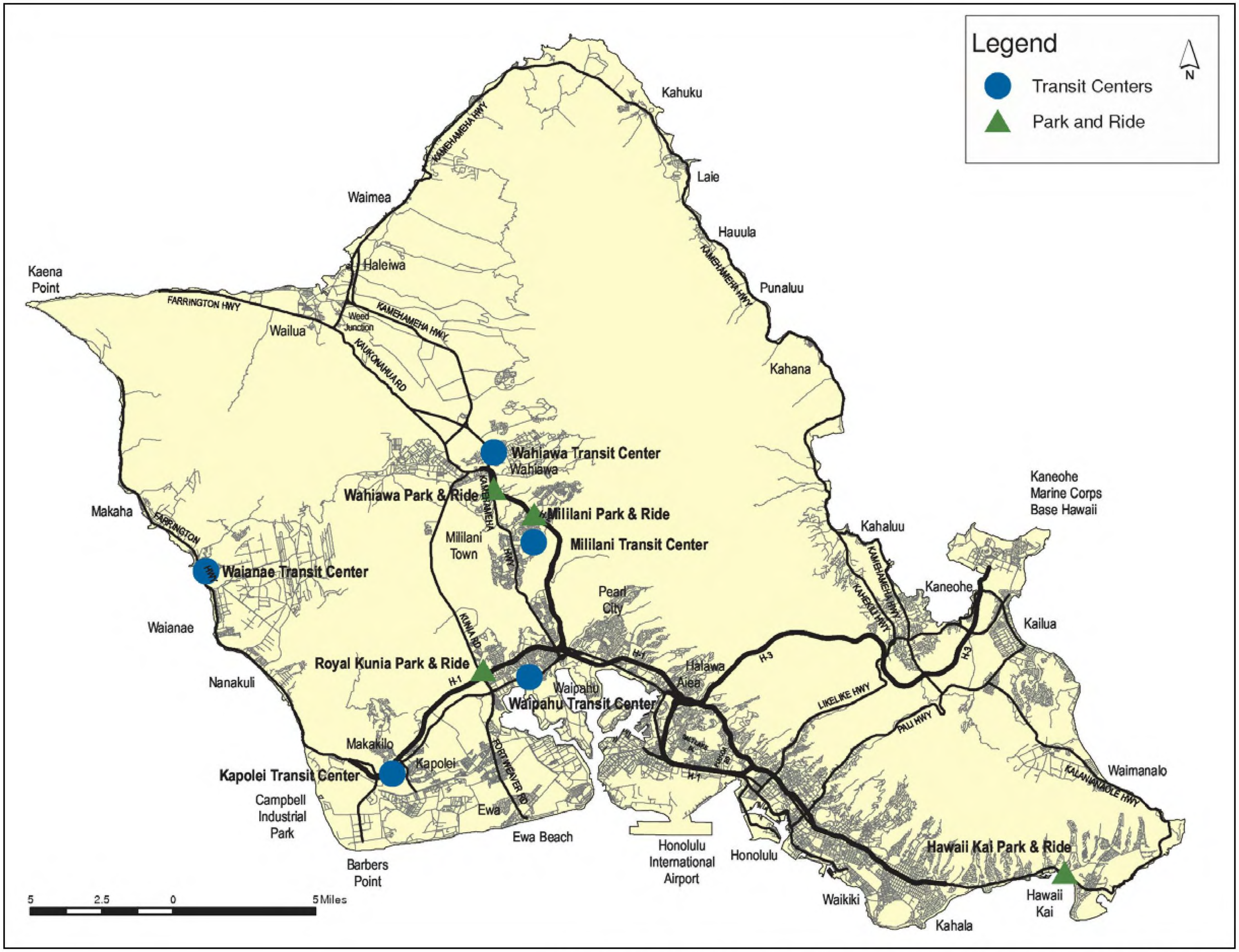


Figure 2-3. Existing Transit Center and Park-and-Ride Locations

Bikeway System

The bikeway system provides residents and tourists with an inexpensive and convenient means of getting around O'ahu for either recreation or commuting purposes. With the continued dependence on the automobile and increasing congestion found in the street system, the development and promotion of alternate travel means is important to the island of O'ahu. Three primary facility types provide the bikeway infrastructure on the island. The three facility types fall into the following categories as defined by *Bike Plan Hawai'i*, *A State of Hawai'i Master Plan* (HDOT, 2003):

- Shared Roadway: A shared roadway is any street or highway that is open to both bicycle and motor vehicle travel. Shared roadways may have signs designating their status as a preferred bike route.
- Bike Lane: A bike lane is a section of the roadway that has been designated by striping, signing, and/or pavement markings for the preferential or exclusive use of bicyclists.
- Shared Use Path: A shared use path is a pathway that is physically separated from motorized vehicular traffic by an open space or barrier and is either within the highway right-of-way or has an independent right-of-way.

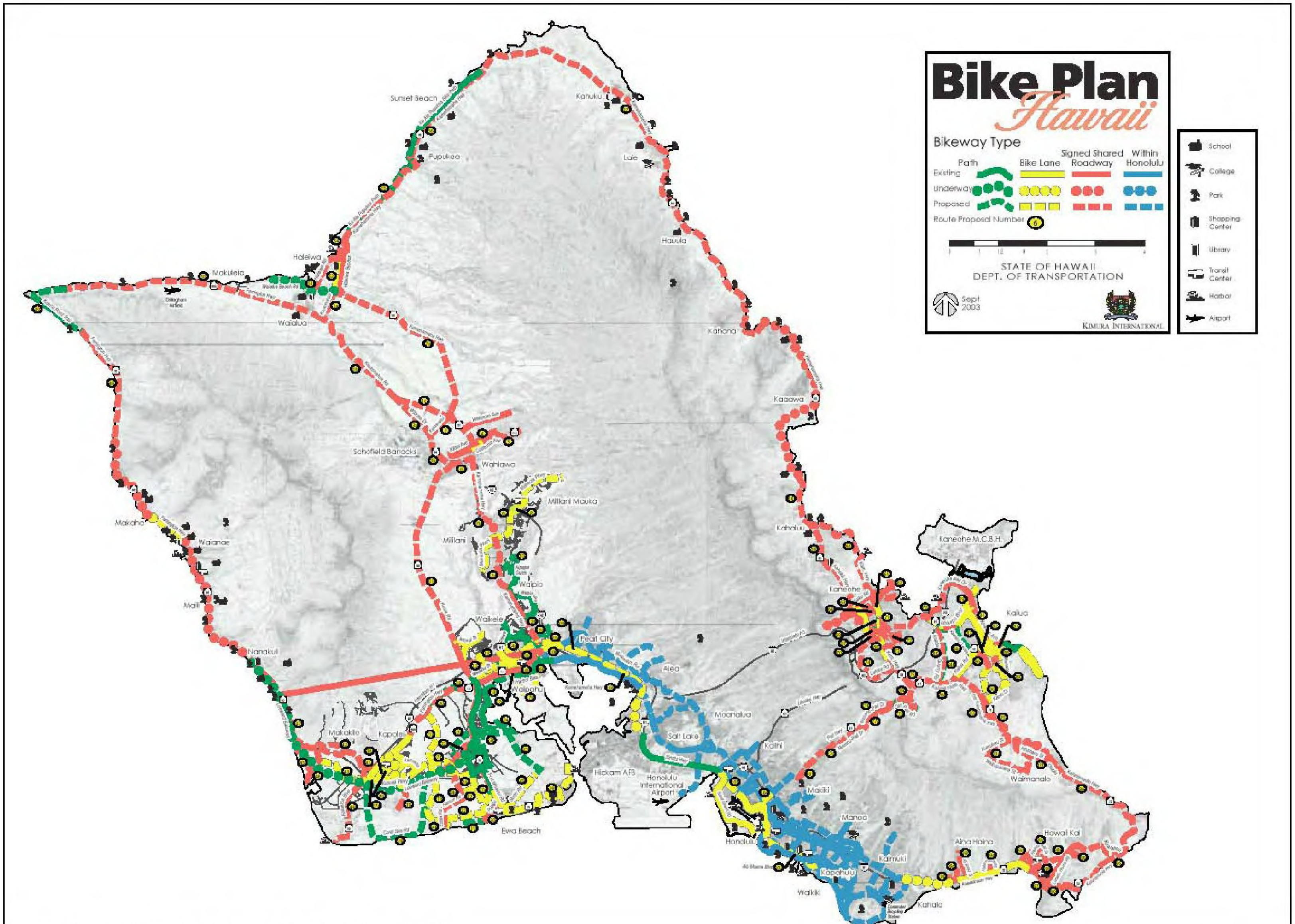
Existing Bikeway System

Figure 2-4 illustrates the locations of existing and planned bikeways on the island. As of 2003, approximately 208 miles of bikeway facilities are available statewide. O'ahu contains 98 miles, or 47 percent, of the statewide bikeway system. Although the current system is geared toward the recreational user, connections to activity centers are provided for commuter use. The following summarizes the bikeway facilities currently available on O'ahu:

- 30.1 miles of shared roadways
- 33.6 miles of bike lanes
- 34.3 miles of shared use paths.

As indicated in *Bike Plan Hawai'i*, 24,777 bicycle and moped registrations were recorded on O'ahu in 2001. In terms of the relationship between registrations and population, O'ahu has an average of 28 bicycle or moped registrations per 1,000 residents.

Every bus in TheBus fleet is equipped with bike racks allowing each bus to hold a maximum of two bikes. As more bicyclists have become aware of this option, bicycle loadings on the bus network now exceed 30,000 per month.



Source: "Bike Plan Hawaii - A State of Hawaii Master Plan" September 2003.

Figure 2-4. Existing and Proposed Bikeways

Parking

Existing parking conditions throughout the corridor are dictated by the specific areas within the corridor. Suburban neighborhoods, such as Pearl City and ʻAiea, have parking situations similar to other suburban neighborhoods (i.e., parking is relatively accessible). There is parking available at most shopping facilities, at residences, and on the street. In Downtown areas, such as the Central Business District, Chinatown, Kaka'ako, and Waikīkī, parking is much like other metropolitan areas – limited. The available land is extremely limited and costly; consequently, parking lots are high priced and have a high demand. In July 2006, Colliers International released a mid-year survey that listed Honolulu as the ninth most expensive metropolitan area in the U.S. for parking. Colliers reported a 27 percent increase in parking costs in Downtown Honolulu between 2005 and 2006. This trend is not likely to continue at the same rate; however, as the occupancy of office space Downtown increases and redevelopment creates new high-density facilities, it is unlikely that parking costs will decrease or that availability will increase. The cost of parking is a major factor in cities throughout the U.S., causing commuters to choose between using transit and using private automobiles for their trip.

Performance of the Existing Transportation System

Traffic Volumes

For the purpose of this discussion, traffic volumes are grouped together by screenlines, which are imaginary lines drawn across the road network. Existing traffic volumes were extracted from historical State files at points where the lines intersect the road network and totaled for all of the individual facilities that cross each screenline.

Several screenlines are used by HDOT to assist in describing traffic conditions on travel corridors throughout the island. Five of those screenlines that describe conditions in the study corridor were selected to compare the project alternatives. These screenlines are shown in Figure 2-5. For the purpose of describing existing conditions, traffic counts for the a.m. and p.m. peak hours, as well as daily volumes, are reported. HDOT provides traffic volume data collected at most locations annually. Since the year 2003 count data represent the most recent available comprehensive set of counts, it was used to analyze existing volume and level-of-service conditions.

Table 2-1 summarizes the existing traffic count volumes for the a.m. and p.m. peak hours, as well as the total daily traffic found at the screenlines. As indicated in the table, the Kapālama Canal screenline (Screenline D), with more than 378,000 daily vehicle crossings and more than 27,000 vehicle crossings during each of the a.m. and p.m. peak hours, was the most traveled of the screenlines analyzed. Nine roadways cross this screenline.

Figure 2-5. Screenline Locations

Table 2-1. 2003 Screenline Volumes

Screenline and Direction	A.M. Peak Hour	P.M. Peak Hour	Daily Total
A. ‘Ewa Wai‘anae bound	5,520	6,770	78,500
A. ‘Ewa Koko Head bound	6,770	5,320	74,040
Screenline total both directions	12,290	12,090	152,540
B. Waikele Stream ‘Ewa bound	5,350	7,600	86,980
B. Waikele Stream Koko Head bound	7,940	6,340	86,290
Screenline total both directions	13,290	13,940	173,270
C. Kalauao ‘Ewa bound	7,640	15,340	172,550
C. Kalauao Koko Head bound	18,870	8,970	169,150
Screenline total both directions	26,510	24,310	341,700
D. Kapālama Canal ‘Ewa bound	11,370	14,510	195,000
D. Kapālama Canal Koko Head bound	15,040	12,660	183,620
Screenline total both directions	26,410	27,170	378,620
E. Ward Avenue ‘Ewa bound	13,520	12,580	171,780
E. Ward Avenue Koko Head bound	11,980	15,110	179,870
Screenline total both directions	25,500	27,690	351,650

The Kalauao Stream screenline (Screenline C) and the Ward Avenue screenline (Screenline E) also experience high levels of traffic, exceeding 340,000 and 350,000 vehicles per day, respectively. The ‘Ewa and Waikele Stream screenlines (Screenlines A and B) do not exceed 175,000 vehicles per day.

At the facility level, the Interstate Freeway system carries a considerable amount of the island’s traffic, with the H-1 Freeway being the most heavily traveled freeway on O‘ahu. At the Kalauao Stream screenline (Screenline C), approximately 20,000 and 17,000 vehicles currently travel on H-1 (both directions combined) during the a.m. and p.m. peak hours, respectively. Approximately 245,000 vehicles travel through this section of H-1 daily.

Traffic Operating Conditions

The operating conditions of a roadway can be represented by a variety of measures, including the volume-to-capacity (V/C) ratio, operating speeds, and the density of traffic on the facility. These measures can be used to determine level-of-service (LOS). A roadway’s V/C ratio compares the volume of traffic traveling on the roadway to the physical capacity of the roadway. Speeds are typically a reflection of the amount of congestion on a roadway or its geometric design characteristics. Traffic density is measured in terms of vehicles per mile per lane and is a function of both volumes and speeds. LOS is a grading scale from A through F for roadway operation; LOS A represents the best condition and LOS F represents more vehicles attempting to use a roadway than the capacity is able to accommodate.

Operating Conditions at Screenlines

Table 2-2 and Table 2-3 summarize the calculated V/C ratios and estimated LOS grades of each facility at the screenline for both directions during the a.m. and p.m. peak hours.

This analysis was conducted using the 2003 count data presented in Table 2-1. Operational data for the H-1 Freeway is provided in Table 2-4.

Table 2-2. A.M. Level-of-Service in the Study Corridor for 2003

SCREENLINE / FACILITY	Facility Capacity (vph)	Observed Volume (vph)	Volume/ Capacity Ratio	Level of Service
A. ʻEwa Koko Head bound				
H-1 Fwy	6,000	3,270	0.55	A
Farrington Hwy	1,700	580	0.34	A
Fort Weaver Rd (NB)	2,300	2,920	1.27	F
Total General Purpose Traffic	10,000	6,770	0.68	B
Total HOV Traffic	NA	NA	NA	NA
B. Waikele Stream Koko Head bound				
H-1 Fwy	8,000	6,600	0.83	D
Waipahu St	750	270	0.36	A
Farrington Hwy	2,300	1,070	0.47	A
Total General Purpose Traffic	11,050	7,940	0.72	C
Total HOV Traffic	NA	NA	NA	NA
C. Kalauao Koko Head bound				
H-1 Fwy	9,500	10,960	1.15	F
H-1 Fwy (HOV)	1,900	1,600	0.84	D
H-1 Fwy (Zipper)	1,900	1,700	0.89	D
Moanalua Rd	1,700	1,650	0.97	E
Kamehameha Hwy	3,450	2,960	0.86	D
Total General Purpose Traffic	14,650	15,570	1.06	F
Total HOV Traffic	3,800	3,300	0.87	D
D. Kapālama Canal Koko Head bound				
Nimitz Hwy	2,700	3,670	1.36	F
Dillingham Blvd	1,700	1,730	1.02	F
N King St	1,700	1,490	0.88	D
H-1 Fwy	6,800	6,860	1.01	F
School St	1,600	1,290	0.81	C
Total General Purpose Traffic	14,500	15,040	1.04	F
Total HOV Traffic	NA	NA	NA	NA
E. Ward Avenue ʻEwa bound				
H-1 Fwy	6,000	6,070	1.01	F
Beretania St	4,250	3,600	0.85	D
Kapiʻolani Blvd	3,200	2,100	0.66	B
Total	13,450	11,770	0.88	D
E. Ward Avenue Koko Head bound				
H-1 Fwy	5,330	5,590	1.05	F
Kīnaʻu St	2,250	1,890	0.84	D
S King St	4,250	2,000	0.47	A
Kapiʻolani Blvd	1,600	800	0.50	A
Total	13,430	10,280	0.77	C

Table 2-3. P.M. Level-of-Service in the Study Corridor for 2003

SCREENLINE / FACILITY	Facility Capacity (vph)	Observed Volume (vph)	Volume/ Capacity Ratio	Level of Service
A. ‘Wai‘anae bound				
H-1 Fwy	6,000	3,440	0.57	A
Farrington Hwy	850	660	0.78	C
Fort Weaver Rd (SB)	2,300	2,670	1.16	F
Total General Purpose Traffic	9,150	6,770	0.74	C
Total HOV Traffic	NA	NA	NA	NA
B. Waikele Stream ‘Ewa bound				
H-1 Fwy	8,000	5,640	0.71	C
Waipahu St	750	510	0.68	B
Farrington Hwy	3,450	1,450	0.42	A
Total General Purpose Traffic	12,200	7,600	0.62	B
Total HOV Traffic	NA	NA	NA	NA
C. Kalauao ‘Ewa bound				
H-1 Fwy	9,500	9,220	0.97	E
H-1 Fwy (HOV)	1,900	1,600	0.84	D
H-1 Fwy (Zipper)	NA	NA	NA	NA
Moanalua Rd	1,700	1,820	1.07	F
Kamehameha Hwy	3,450	2,700	0.78	C
Total General Purpose Traffic	14,650	13,740	0.94	E
Total HOV Traffic	1,900	1,600	0.84	D
D. Kapālama Canal ‘Ewa bound				
Nimitz Hwy	2,700	3,400	1.26	F
Dillingham Blvd	1,700	1,490	0.88	D
N King St	1,700	1,340	0.79	C
H-1 Fwy	7,200	7,520	1.04	F
School St	1,600	760	0.48	A
Total General Purpose Traffic	14,900	14,510	0.97	E
Total HOV Traffic	NA	NA	NA	NA
E. Ward Avenue ‘Ewa bound				
H-1 Fwy	5,280	5,110	0.97	E
Beretania St	4,250	3,420	0.80	D
Kapi‘olani Blvd	1,600	1,440	0.90	E
Total	11,130	9,970	0.90	E
E. Ward Avenue Koko Head bound				
H-1 Fwy	5,280	4,880	0.92	E
Kīna‘u St	3,000	1,520	0.51	A
S King St	5,100	3,960	0.78	C
Kapi‘olani Blvd	3,200	1,760	0.55	A
Total	16,580	12,120	0.73	C

Table 2-4. Existing and 2030 No Build Alternative A.M. Peak Period Speeds and Level-of-Service on H-1

Location	2005		2030	
	Speed (mph)	Level-of-Service[1]	Speed (mph)	Level-of-Service[1]
Waiawa Interchange – Koko Head Bound				
General Purpose Traffic	19	F	12	F
HOV Lane Traffic	24	F	14	F
Zipper Lane Traffic	39	F	37	F
Kalauao Stream – Koko Head Bound				
General Purpose Traffic	20	F	15	F
HOV Lane Traffic	46	E	24	F
Zipper Lane Traffic	37	F	36	F
East of Middle Street Merge – Koko Head Bound				
General Purpose Traffic	14	F	24	F
Liliha Street – Koko Head Bound				
General Purpose Traffic	19	F	12	F
East of Ward Avenue – ‘Ewa Bound				
General Purpose Traffic	21	F	18	F
West of University Avenue – ‘Ewa Bound				
General Purpose Traffic	36	F	34	F

[1]Level-of-Service is calculated based on vehicle density, a function of traffic volume and speed.

In general, congested conditions (e.g., LOS E or F) occur during the a.m. and p.m. peak hours on many of the major roadways, particularly in the peak direction (i.e., toward Downtown in the morning and away from Downtown in the evening) on segments of the H-1 Freeway from the Waiawa Interchange to the UH Mānoa area, where stop-and-go conditions are typical. Signalized routes, such as the Nimitz Highway, are typified by requiring more than one traffic signal cycle to clear intersections during peak periods. To avoid peak-hour congestion, motorists have changed their time of travel, resulting in extended peak traffic conditions. Weekday a.m. and p.m. peak traffic conditions typically last three to four hours each. Weekend traffic during the mid-day also resembles weekday peak-period conditions.

More specifically, the screenline analysis indicates that existing travel conditions are congested during the a.m. peak hour for Koko Head-bound traffic crossing the Kalauao Stream in Pearl City (V/C ratio of 1.06 [LOS F]) and the Kapālama Canal closer to Downtown (V/C 1.04 [LOS F]). Within the a.m. peak hour, the most congested individual facility was the Nimitz Highway on the Kapālama Drainage Canal screenline (Screenline D); the facility operated at LOS F in both directions, with V/C ratios ranging from 1.01 to 1.36. Fort Weaver Road at the ‘Ewa screenline (Screenline A) also operated at LOS F in both directions, with V/C ratios ranging from 1.27 to 1.31.

These conditions are also indicated by estimated travel speeds along H-1 in the corridor, as shown in Table 2-4. The table indicates that existing speeds between the Waiawa Interchange and Downtown in the general purpose lanes range from 14 to 19 mph (LOS F) and would generally get worse by the year 2030 despite many planned roadway improvements. The only location where speeds in the corridor on H-1 are predicted to increase in 2030 as compared to today is east of the Middle Street merge, where the addition of a lane is expected to result in an average a.m. peak period speed of 24 mph, which still indicates LOS F at this location.

Based on recent traffic counts as well as field observations, the p.m. peak period is also experiencing a high level of congestion in the corridor. Analysis of operations at the Kalauao Stream and Kapālama Canal screenlines shows p.m. peak-hour levels-of-service of E for each (V/C/ ratio of 0.94 at Kalauao Stream and 0.97 at Kapālama Canal); however, H-1 itself is over-capacity and operating at LOS F. The most congested facility in this travel period was the Nimitz Highway at the Kapālama Canal screenline (Screenline D); the facility operated at LOS F in both directions, with V/C ratios ranging from 1.20 to 1.26.

Transit Operating Conditions

The public transit system, TheBus, uses the general roadway network described above. The major factors influencing bus operating conditions are the traffic conditions under which the service operates, passenger loading time, and bus-stop spacing. Honolulu has substantial traffic congestion, high ridership and load factors, and closely spaced bus stops. Combined, these factors result in declining bus operating speeds over recent years, which are not competitive with the private automobile. Between 2002 and 2006, islandwide average bus speeds decreased four percent. Because congestion in the study corridor is greater than in other parts of O‘ahu, the decrease in average bus speed in the corridor is greater than the islandwide average. To account for the congestion, OTS has lengthened the peak-period scheduled trip lengths by between nine and 26 percent for several routes operating in the study corridor. Trip lengths for three typical routes serving various parts of O‘ahu are shown in Figure 2-6. Figure 2-7 illustrates the downward trend in TheBus systemwide speeds from 1984 through 2006.

Implementation of peak-period HOV lanes on H-1 and H-2, as well as the addition of the H-1 a.m. peak zipper lane, were intended to provide higher priority and mobility to buses and other high-occupancy vehicles. However, with a minimum eligibility requirement of only two persons per vehicle, these special lanes are often just as congested as the adjacent general purpose lanes (Table 2-4), thus negating much of the travel time advantage for transit buses.

As roadways become more congested, they become more susceptible to substantial delays caused by incidents such as traffic accidents or heavy rain. As a result, current transit schedules in the corridor are not reliable. Recent statistics from TheBus indicate that on a systemwide basis 27 percent of all buses were more than five minutes late. During the a.m. peak period, express buses were more than five minutes late 38 percent of the time (DTS, 2006).

Transit speed and reliability with mixed-traffic operations would continue to diminish in the corridor as the number of transit passengers increases and traffic volumes approach roadway capacity on more streets.

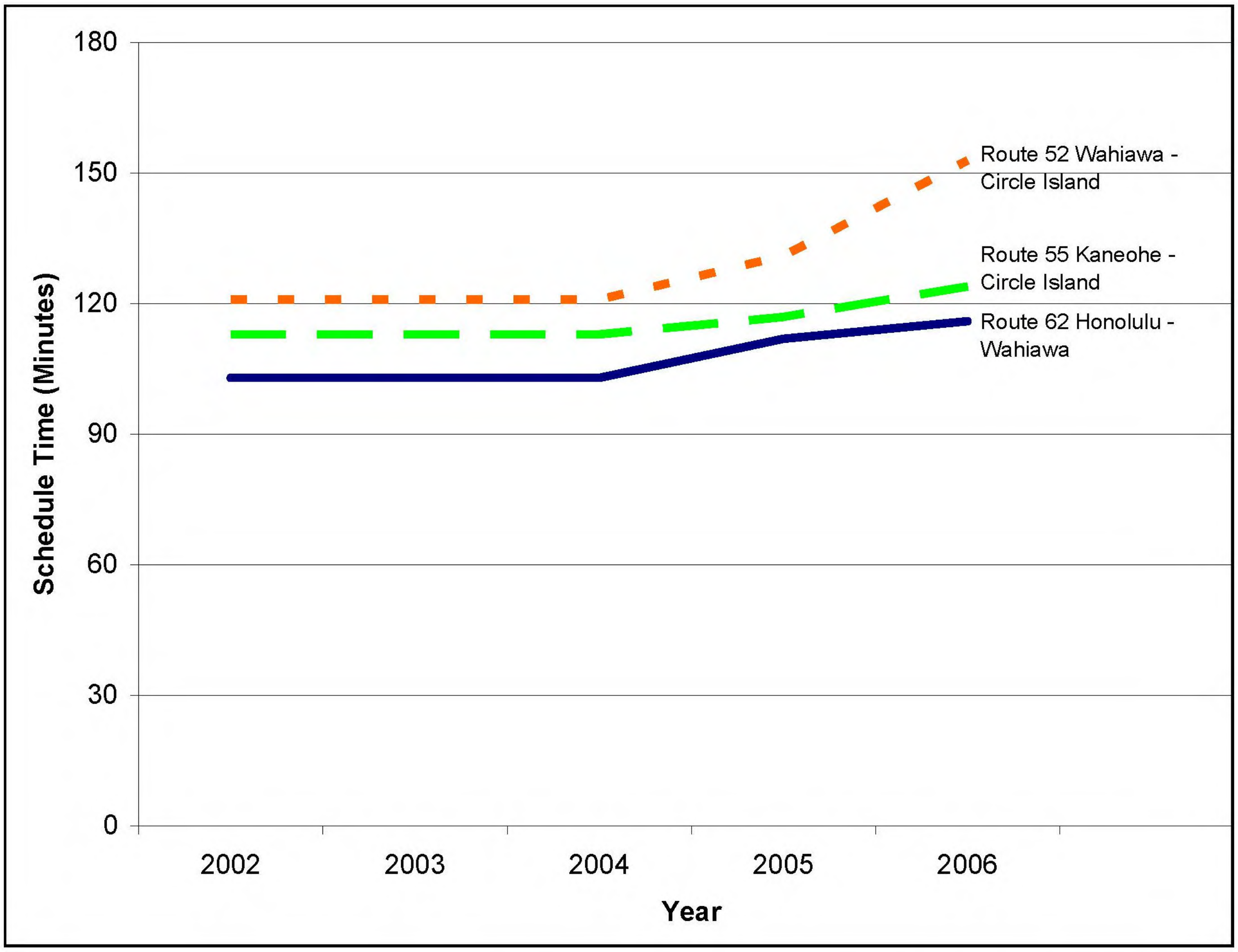


Figure 2-6. P.M. Peak-period Scheduled Bus Trip Times

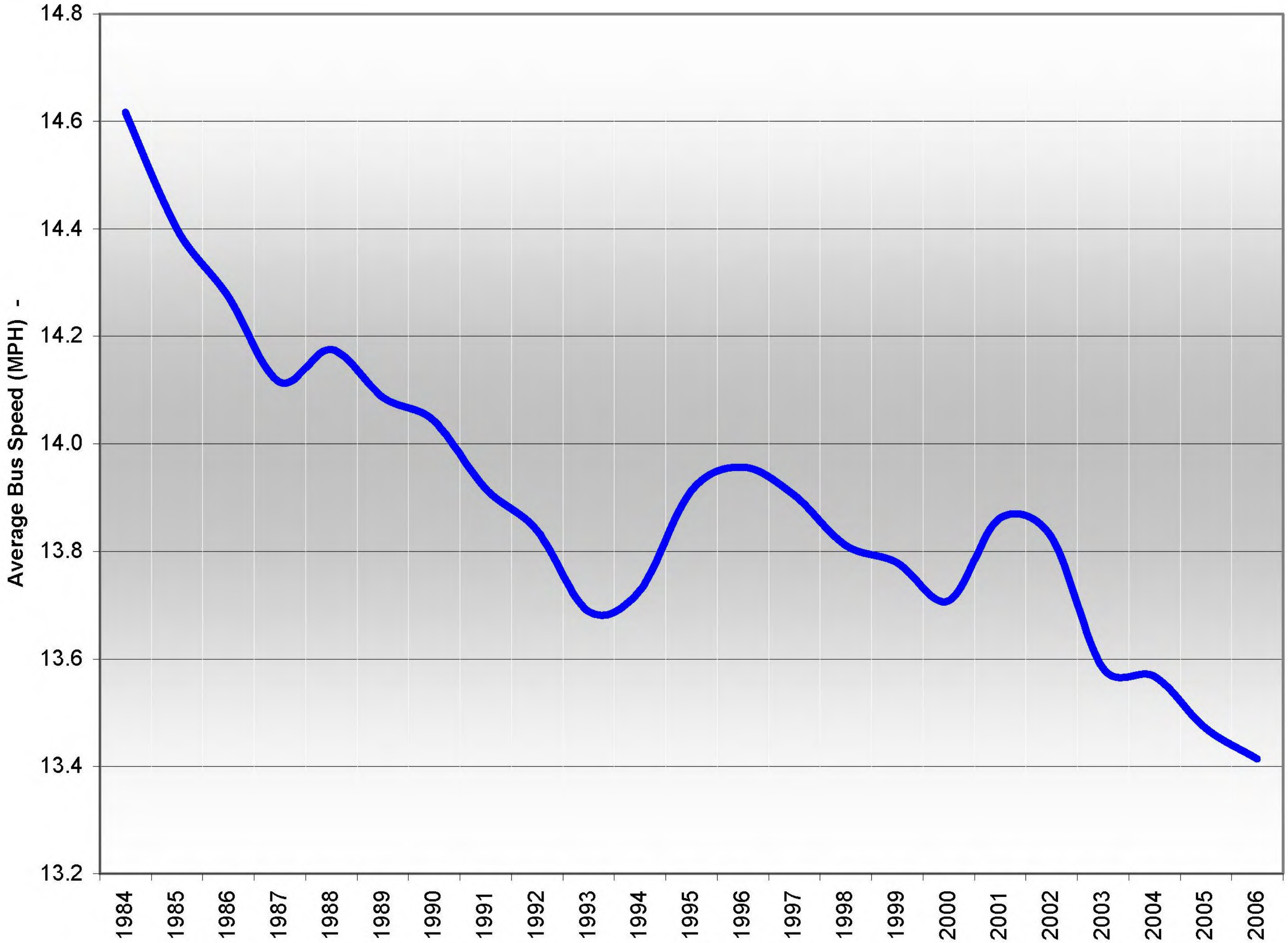


Figure 2-7. TheBus Systemwide Average Bus Speeds: 1984 to 2006

Chapter 3 Transportation Demand and Travel Patterns

This chapter compares year 2030 projected transportation demand for each alternative to existing travel patterns. To characterize the travel patterns within the corridor and island-wide, current and future daily total and peak-period home-based work trips are assessed along with the projected modes that travelers would use in the future. Also included is a discussion of the increases in person-carrying capacity at selected locations provided by the various alternatives.

Trips

Table 3-1 and Table 3-2 show the breakdown of where trips originate from and are destined to by the 25 Transportation Analysis Areas (TAAs). Table 3-1 compares daily trips for all trip purposes for the year 2030 against those for the year 2005, while Table 3-2 makes a similar comparison for peak-period home-based work trips. Note that these tables represent O‘ahu resident trips and do not include visitor trips. Table 3-3 compares the number of trips by trip purpose for the year 2030 versus 2005. The year 2030 trip distribution patterns and average trip lengths are the same for all of the future year alternatives being studied. The mode choice projections vary by alternative and can indicate how effective the transit system is relative to the other options.

Based on Table 3-1 and Table 3-2, an islandwide increase in daily all-purpose trips of 27 percent and an increase of 21 percent for peak period home-based work trips are expected between 2005 and 2030.

A comparison of daily all-purpose trips between 2005 and 2030 indicates that travel patterns would shift in response to the areas of expected growth, both islandwide and within the corridor. Trips to and from the Primary Urban Center areas of Downtown, Kaka‘ako, and Punchbowl-Sheridan-Date would show significant increases. The areas of Honouliuli- ‘Ewa Beach and Kapolei-Ko ‘Olina-Kalaeloa are projected to also have large increases in trips, both generated and attracted. Kapolei-Ko ‘Olina-Kalaeloa shows the greatest increase by far of any area. Other areas ‘Ewa of the Primary Urban Center are also projected to have large increases in trips, including ‘Aiea-Pearl City, Waipahu-Waikele-Kunia, and Waiawa-Koa Ridge. These projections indicate that more trips would be made to and from the Leeward side of the island and suggest that not only would there be more travel demand in the study corridor, but also that travel directionality in the corridor would change as more jobs are created in Leeward areas.

The home-based work data illustrate similar patterns as the daily trips and provides additional evidence of increasing employment opportunities outside the Primary Urban Center with a shift to the Leeward areas. Honouliuli –‘Ewa Beach and Kapolei-Ko ‘Olina-Kalaeloa are projected to experience the largest increases in origin trips, and

Table 3-1. Year 2030 Daily Compared to Existing Trips by Transportation Analysis Area, All Modes

Transportation Analysis Area		2005 Daily Trips, All Purposes				2030 Daily Trips, All Purposes					
		Origin		Destination		Origin			Destination		
		Trips	% of Total	Trips	% of Total	Trips	% of Total	Change from 2005	Trips	% of Total	Change from 2005
1*	Ward-Chinatown	97,000	3.6	224,000	8.3	138,000	4.0	41,000	255,000	7.4	31,000
2*	Kaka‘ako	60,000	2.2	125,000	4.6	142,000	4.1	82,000	166,000	4.8	41,000
3*	Punchbowl-Sheridan-Date	156,000	5.8	184,000	6.8	200,000	5.8	44,000	229,000	6.7	45,000
4*	Waikīkī	87,000	3.2	143,000	5.3	100,000	2.9	13,000	160,000	4.7	17,000
5*	Kāhala-Tantalus	167,000	6.2	146,000	5.4	182,000	5.3	15,000	172,000	5.0	26,000
6*	Pauoa-Kalihi	158,000	5.9	113,000	4.2	171,000	5.0	13,000	136,000	4.0	23,000
7*	Iwilei-Māpunapuna-Airport	108,000	4.0	195,000	7.2	126,000	3.7	18,000	216,000	6.3	21,000
8*	Hickam-Pearl Harbor	65,000	2.4	155,000	5.7	69,000	2.0	4,000	168,000	4.9	13,000
9*	Moanalua-Hālawa	168,000	6.2	211,000	7.8	173,000	5.0	5,000	231,000	6.7	20,000
10*	‘Aiea-Pearl City	237,000	8.8	180,000	6.7	257,000	7.5	20,000	232,000	6.7	52,000
11*	Honouliuli-‘Ewa Beach	119,000	4.4	57,000	2.1	236,000	6.9	117,000	106,000	3.1	49,000
12*	Kapolei-Ko ‘Olina-Kalaeloa	50,000	1.9	72,000	2.7	210,000	6.1	160,000	252,000	7.3	180,000
13*	Makakilo-Makaīwa	35,000	1.3	11,000	0.4	60,000	1.8	25,000	19,000	0.6	8,000
14*	Waipahu-Waikele-Kunia	143,000	5.3	110,000	4.1	171,000	5.0	28,000	156,000	4.5	46,000
15*	Waiawa-Koa Ridge	36,000	1.3	27,000	1.0	113,000	3.3	77,000	71,000	2.1	44,000
16	Mililani-Melemanu-Kīpapa	150,000	5.6	88,000	3.3	162,000	4.7	12,000	110,000	3.2	22,000
17	Wahiawā-Whitmore-Schofield	95,000	3.5	100,000	3.7	100,000	2.9	5,000	114,000	3.3	14,000
18	East Honolulu	131,000	4.9	60,000	2.2	139,000	4.0	8,000	67,000	2.0	7,000
19	Kāne‘ohe-Kahalu‘u-Kualoa	145,000	5.4	91,000	3.4	150,000	4.4	5,000	101,000	2.9	10,000
20	Kailua-Mokapu-Waimānalo	165,000	6.1	134,000	5.0	169,000	4.9	4,000	146,000	4.3	12,000
21	Ko‘olauloa	36,000	1.3	37,000	1.4	43,000	1.3	7,000	45,000	1.3	8,000
22	North Shore	49,000	1.8	31,000	1.1	55,000	1.6	6,000	35,000	1.0	4,000
23	Wai‘anae Coast	98,000	3.6	66,000	2.4	118,000	3.4	20,000	83,000	2.4	17,000
24*	Mānoa-Tantalus	117,000	4.3	66,000	2.4	129,000	3.8	12,000	83,000	2.4	17,000
25*	University	23,000	0.9	73,000	2.7	25,000	0.7	2,000	82,000	2.4	9,000
	Total[1,2]	2,698,000	100	2,698,000	100	3,436,100	100	738,100	3,436,100	100	738,100

*TAA is within the Study Corridor.
[1]Values may not add exactly to the total because of rounding.
[2]Values include resident trips only.

Table 3-2. Year 2030 Compared to Existing Peak-Period Work Trips by Transportation Analysis Area, All Modes

Transportation Analysis Area		2005 Peak-Period Home-Based Work Trips, All Purposes				2030 Peak-Period Home-Based Work Trips, All Purposes					
		Origin		Destination		Origin			Destination		
		Trips	% of Total	Trips	% of Total	Trips	% of Total	Change from 2005	Trips	% of Total	Change from 2005
1*	Ward-Chinatown	10,000	1.9	69,000	13.2	17,000	2.7	7,000	76,000	12.0	7,000
2*	Kaka‘ako	6,000	1.1	28,000	5.4	24,000	3.8	18,000	34,000	5.3	6,000
3*	Punchbowl-Sheridan-Date	28,000	5.4	38,000	7.3	35,000	5.5	7,000	45,000	7.1	7,000
4*	Waikīkī	16,000	3.1	47,000	9.0	17,000	2.7	1,000	51,000	8.1	4,000
5*	Kāhala-Tantalus	34,000	6.5	19,000	3.6	34,000	5.4	0	22,000	3.5	3,000
6*	Pauoa-Kalihi	34,000	6.5	17,000	3.3	35,000	5.5	1,000	19,000	3.0	2,000
7*	Iwilei-Māpunapuna-Airport	13,000	2.5	38,000	7.3	15,000	2.4	2,000	42,000	6.7	4,000
8*	Hickam-Pearl Harbor	5,000	1.0	39,000	7.5	5,000	0.8	0	42,000	6.7	3,000
9*	Moanalua-Hālawa	29,000	5.5	43,000	8.2	27,000	4.3	-2,000	45,000	7.1	2,000
10*	‘Aiea-Pearl City	48,000	9.2	23,000	4.4	47,000	7.4	-1,000	30,000	4.7	7,000
11*	Honouliuli-‘Ewa Beach	28,000	5.4	7,000	1.3	52,000	8.2	24,000	14,000	2.1	7,000
12*	Kapolei-Ko ‘Olina-Kalaeloa	8,000	1.5	16,000	3.1	34,000	5.4	26,000	48,000	7.7	32,000
13*	Makakilo-Makaīwa	9,000	1.7	1,000	0.2	14,000	2.2	5,000	3,000	0.5	2,000
14*	Waipahu-Waikele-Kunia	28,000	5.4	13,000	2.5	31,000	4.9	3,000	21,000	3.3	8,000
15*	Waiawa-Koa Ridge	8,000	1.5	6,000	1.1	24,000	3.8	16,000	13,000	2.1	7,000
16	Mililani-Melemanu-Kīpapa	33,000	6.3	11,000	2.1	33,000	5.2	0	14,000	2.2	3,000
17	Wahiawā-Whitmore-Schofield	18,000	3.4	24,000	4.6	17,000	2.8	-1,000	26,000	4.0	2,000
18	East Honolulu	32,000	6.1	7,000	1.3	32,000	5.0	0	7,000	1.1	0
19	Kāne‘ohe-Kahalu‘u-Kualoa	32,000	6.1	12,000	2.3	32,000	5.0	0	13,000	2.0	1,000
20	Kailua-Mokapu-Waimānalo	34,000	6.5	25,000	4.8	33,000	5.1	-1,000	26,000	4.1	1,000
21	Ko‘olauloa	7,000	1.3	6,000	1.1	8,000	1.2	1,000	6,000	1.0	0
22	North Shore	11,000	2.1	4,000	0.8	11,000	1.8	0	4,000	0.7	0
23	Wai‘anae Coast	21,000	4.0	8,000	1.5	24,000	3.8	3,000	9,000	1.4	1,000
24*	Mānoa-Tantalus	29,000	5.5	7,000	1.3	30,000	4.8	1,000	9,000	1.5	2,000
25*	University	2,000	0.4	13,000	2.5	2,000	0.3	0	14,000	2.2	1,000
	Total[1,2]	523,000	100	523,000	100	632,200	100	109,200	632,200	100	109,200

*TAA is within the Study Corridor.
[1]Values may not add exactly to the total because of rounding.
[2]Values include resident trips only.

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Kapolei-Ko ‘Olina-Kalaeloa the largest increase in destination trips. While the Ward-Chinatown TAA, which includes the Central Business District and many employment centers Downtown, remains the single highest destination for peak-period home-based work trips, it is clear that a shift to the Leeward side is occurring.

Systemwide Travel by Mode

Table 3-3 shows estimated average weekday trips by mode for year 2005 and each of the alternatives for year 2030. Table 3-4 shows the estimated transit mode share of home-based work trips. These trips are typically more representative of the peak travel periods. The following sub-sections discuss the results for each alternative. Figure 3-1 compares the changes from the No Build Alternative in daily transit trips and private vehicle trips for the TSM, Managed Lane, and Fixed Guideway Alternatives.

Table 3-3. Total Daily Person Trips by Mode

Alternative	Transit	Vehicle	Bicycle/Walk	Total Trips[1]
2005 Existing Conditions				
Existing Conditions	178,400	2,370,000	450,100	2,998,500
% Mode Share	*5.9%*	*79.0%*	*15.0%*	*100%*
Alternative 1: 2030 No Build				
No Build Alternative	232,100	3,022,100	547,300	3,801,500
% Mode Share	*6.1%*	*79.5%*	*14.4%*	*100%*
Alternative 2: 2030 Transportation System Management				
TSM Alternative	243,100	3,011,900	546,600	3,801,600
% Mode Share	*6.4%*	*79.2%*	*14.4%*	*100%*
Alternative 3: 2030 Managed Lane				
Two-direction Option	247,000	3,008,200	546,500	3,801,700
% Mode Share	*6.5%*	*79.1%*	*14.4%*	*100%*
Reversible Option	247,400	3,007,600	546,700	3,801,800
% Mode Share	*6.5%*	*79.1%*	*14.4%*	*100%*
Alternative 4: 2030 Fixed Guideway				
Kalaeloa – Salt Lake – North King – Hotel	293,600	2,962,100	546,300	3,802,000
% Mode Share	*7.7%*	*77.9%*	*14.4%*	*100%*
Kamokila – Airport – Dillingham – King with a Waikīkī Branch	287,800	2,968,700	546,500	3,803,000
% Mode Share	*7.6%*	*78.1%*	*14.4%*	*100%*
Kalaeloa – Airport – Dillingham – Halekauwila	294,100	2,962,500	546,000	3,802,600
% Mode Share	*7.7%*	*77.9%*	*14.4%*	*100%*
20-mile Alignment East Kapolei to Ala Moana Center	281,900	2,974,100	546,200	3,802,200
% Mode Share	*7.4%*	*78.2%*	*14.4%*	*100%*

[1]Includes resident transit, visitor transit, resident vehicle, visitor automobile, and non-motorized trips.

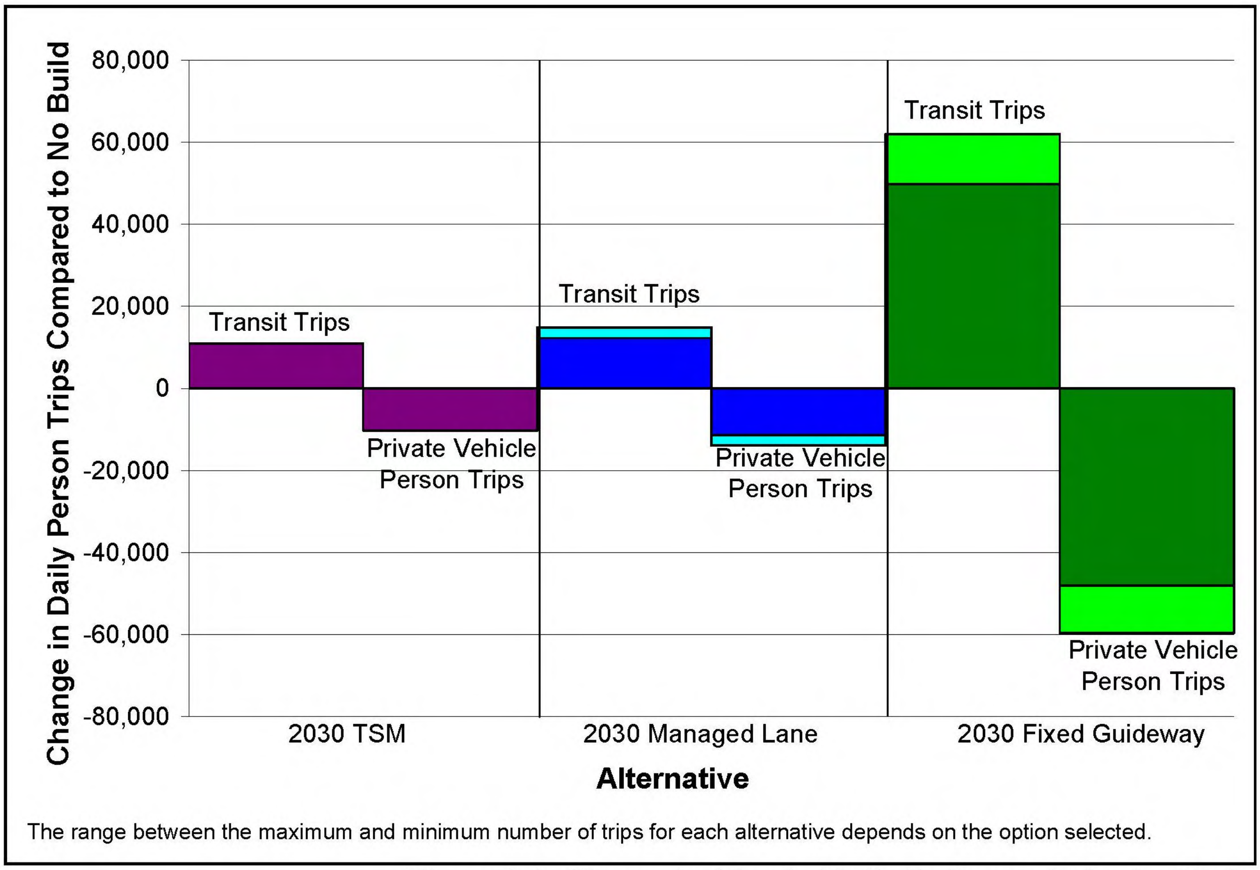

Figure 3-1. Change in Islandwide Daily Person Trips by Mode

Table 3-4. Transit Mode Share for Home-based Work Trips by Alternative

Alternative	% Transit Mode Share
2005 Existing Conditions	
Existing Conditions	10.9%
Alternative 1: 2030 No Build	
No Build Alternative	11.2%
Alternative 2: 2030 Transportation System Management	
TSM Alternative	12.1%
Alternative 3: 2030 Managed Lane	
Two-direction Option	12.6%
Reversible Option	12.6%
Alternative 4: 2030 Fixed Guideway	
Kalaeloa – Salt Lake – North King – Hotel	16.2%
Kamokila – Airport – Dillingham – King with a Waikīkī Branch	15.7%
Kalaeloa – Airport – Dillingham – Halekauwila	16.2%
20-mile Alignment East Kapolei to Ala Moana Center	15.2%

Alternative 1: No Build

As compared to year 2005, total systemwide daily person trips are projected to increase by about 27 percent for the No Build Alternative, keeping pace with the projected growth in population between 2005 and 2030. However, transit trips (30 percent) are projected to increase at a slightly higher rate than automobile trips (27.5 percent). This is likely because future roadway congestion decreases the attractiveness of the private automobile, while enhancement of the HOV and zipper-lane systems provides some additional benefits, and hence, attractiveness, to the transit mode. Transit mode share for total daily trips as well as home-based work trips (Table 3-4) is expected to increase slightly over the current mode share.

Alternative 2: Transportation System Management

As shown in Table 3-3, the TSM Alternative, as a result of its enhanced bus service, results in a slightly higher transit mode share at 6.4 percent (daily trips) and 12.1% (home-based work trips (Table 3-4)) than the No Build Alternative, as well as a five-percent increase in overall systemwide daily transit trips. Automobile trips and non-motorized trips are projected to decrease slightly compared to the No Build Alternative as more people are attracted to transit (Figure 3-1).

Alternative 3: Managed Lane

Both Managed Lane Alternative options, as shown in Table 3-3, are expected to result in a slightly higher transit mode share for daily trips (6.5 percent) as well as for home-based work trips (12.6 percent (Table 3-4)) than either the No Build or the TSM Alternatives. The Managed Lane Alternative options are also expected to experience slightly more systemwide daily transit trips (about 7 to 8 percent) than the No Build Alternative. The projected increase in transit trips and decrease in private vehicle trips are similar to that of the TSM Alternative (Figure 3-1).

Alternative 4: Fixed Guideway

All of the Fixed Guideway Alternative options are expected to experience significantly higher systemwide daily transit ridership and mode share in comparison with all of the other alternatives, as shown in Table 3-3. The three alignment combination options are expected to result in transit mode shares of 7.6 to 7.7 percent for daily trips and up to 16.2% for home-based work trips (Table 3-4). The Fixed Guideway options also see an increase in total daily transit trips over the No Build Alternative by 55,700 to 62,000 trips (Figure 3-1). The vast majority of these trips are drawn away from the highway mode as automobile travel is expected to decrease by 53,400 to 60,000 trips. Of the three combination options, the Kalaeloa – Airport – Dillingham – Halekauwila combination is projected to have the highest transit ridership with 294,100 trips. The 20-mile Alignment is expected to result in a transit mode share of 7.4 percent and an increase over the No Build Alternative of more than 46,000 transit trips (Figure 3-1). The transit mode share for home-based work trips for the 20-mile Alignment, 15.2 percent, is comparable with those of the Full-corridor Alignments. Similar to the Full-corridor Alignments, the bulk of these trips are expected to be drawn from the highway mode as automobile travel is projected to decrease by 44,600 trips in comparison to the No Build Alternative, by

33,000 as compared to the TSM Alternative, and by 28,000 to 29,000 trips as compared to the Managed Lane Alternative options.

Chapter 4 Transit Service Impacts

This chapter presents data for transit performance of each alternative. Characteristics of transit travel times and transit ridership have been identified as the major performance indicators of transit.

Description of Transit Service Plan

Significant characteristics of the proposed bus transit service plan for each of the alternatives are discussed in this section. Table 1-1 compares bus fleet size requirements for the proposed plans for each of the alternatives with year 2005 requirements.

Alternative 1: No Build

In anticipation of increased roadway congestion and slower overall bus transit speeds, the No Build Alternative's transit component would include an increase in fleet size to allow service frequencies to remain close to what they are today. It would also include new bus service to serve proposed growth areas (e.g., Kapolei), and restructured "hub-and-spoke" service to serve regional transit centers.

The No Build Alternative includes a small increase in the number of buses required for the time period of analysis. The number of additional buses purchased would need to be adequate to support increasing demand while maintaining the current level of service. Given this assumption, TheBus fleet would need to be increased by 89 vehicles, from an existing fleet size of 525 buses to 614 buses in the year 2030 (Table 1-1).

Alternative 2: Transportation System Management

Three types of service modifications have been identified for the TSM Alternative to provide the best mobility without a major capital project to serve the population and employment growth in the project corridor. The first includes frequency adjustments, primarily during peak periods to serve work trip demands. Frequency adjustments involve adding trips to community circulators, limited-stop express routes, and ferry services.

The second modification is the addition of three peak-period bus express routes to serve the corridor and Downtown from developing areas such as Royal Kunia, Koa Ridge, and Waiawa.

The third modification is the restructuring of bus services in Pearl City and ʻAiea to focus on the new transit center proposed there and the extension of some urban Honolulu bus routes farther into local neighborhoods.

The TSM Alternative would require a fleet increase from 525 buses to 765 buses (Table 1-1). The increase in buses would accommodate future projected growth. Additionally, the following park-and-ride lots would be added:

- Kapolei Parkway/Hanua Street – 1,200 parking stalls
- UH West O‘ahu off of North-South Road – 1,700 parking stalls
- Ka Uka Road/H-2 – 1,000 parking stalls
- Aloha Stadium – 1,300 parking stalls.

The park-and-ride facilities would be located to intercept vehicles prior to the major choke points of the freeway system, such as occurs at the Waiawa Interchange of H-1 with H-2. The location for Central O‘ahu residents would be near Ka Uka Boulevard and H-2. Residents would drive to the park-and-ride facility to access buses for their trip to town. Buses during the peak travel period would depart approximately every five minutes. Wai‘anae Coast and West Kapolei residents would be able to use the Kapolei Parkway and Hanua Street park-and-ride facility.

Alternative 3: Managed Lane

The bus network would be structured to support access to the managed lane via bus transfers at park-and-ride locations as well as by the addition of express bus routes using the managed lane viaduct. The two design variations for the Managed Lane Alternative offer a limited number of access points in order to maintain free-flowing lane operations. Bus operations for the managed lane facility would be staged from park-and-ride facilities to serve Central and Leeward O‘ahu residents. As with the TSM Alternative, new park-and-ride lots would be located at the following sites:

- Kapolei Parkway/Hanua Street – 1,200 parking stalls
- UH West O‘ahu off of North-South Road – 1,700 parking stalls
- Ka Uka Road/H-2 – 1,000 parking stalls
- Aloha Stadium – 1,300 parking stalls.

The park-and-ride planned at the intermediate access point at Aloha Stadium would be within the stadium's parking lot adjacent to the managed lane's on- and off-ramps. The lot would be integrated with the managed lane access ramps so transit riders could access the bus system via this intermediate access point.

The enhanced bus system would include an increase in fleet size (Table 1-1). Based on the redesigned bus network for the Managed Lane Alternative, it is estimated that 321 new buses beyond the existing fleet would need to be added for the Two-direction Option and 381 new buses would need to be added for the Reversible Lanes Option to provide a sufficient fleet to perform operations as planned. These additional buses would create a fleet size of 846 buses for the Two-direction Option and 906 buses for the Reversible Option. In addition, the normal schedule of bus replacement every 12 years would be maintained.

All supporting maintenance facilities and services included in the TSM Alternative are also included in the Managed Lane Alternative. In addition, the Managed Lane Alternative includes additional express bus services dedicated to using the managed lane.

Alternative 4: Fixed Guideway

Multiple alignment options through most sections of the corridor were analyzed for the Fixed Guideway Alternative. As a result of these analyses, three Full-corridor Alignment combinations were selected for thorough analysis and presentation in this report, along with one 20-mile Alignment option.

Most of the changes to the transit network for the Fixed Guideway Alternative result from adjustments to provide access to the fixed guideway stations. The fixed guideway system allows many of the existing and planned future express long-haul routes to be shortened or rerouted where the fixed guideway provides improved service. Local buses and community circulators would provide increased service frequency and would include stops at nearby fixed guideway stations to provide access to the fixed guideway system. The reduced requirement for long-haul express buses and the increased frequency of the local and community circulator buses create a large improvement in the overall performance of the bus transit network while not requiring a significant number of new buses for the greatly improved service.

Service from areas outside of the corridor would be modified to provide the most convenient access to the fixed guideway stations. For example, express buses from the Waiʻanae area would provide direct access to the fixed guideway stations at Hanua Street and the Kapolei Transit Center. Express buses from Central Oʻahu would provide access to the Pearl Highlands Station. Express routes that deviate more than five minutes from the Fixed Guideway alignments would not be revised and would continue to serve their routes as planned. This would ensure a continuity of express service for those who cannot take advantage of the fixed guideway.

Community circulator buses would provide service at shorter headways than are currently operating. This would improve service within communities and provide more opportunities for people to use transit.

Park-and-ride lots proposed to support the Fixed Guideway Alternative options are listed in Table 4-1. The park-and-ride facilities would be located to provide an opportunity for parking vehicles prior to the major choke points of the freeway system. Waiʻanae Coast and West Kapolei residents would be able to use the Kapolei Parkway and Hanua Street park-and-ride facility. ʻEwa Beach residents could use either the lot at Saratoga Avenue/ North-South Road or UH West Oʻahu (either the one on North-South Road or on Farrington Highway) depending on the Fixed Guideway alignment.

Central Oʻahu residents could use either the Ka Uka Boulevard and H-2 park-and-ride lot or drive directly to the Pearl Highlands Station (Kamehameha Highway and Kuala Street) to use the proposed facility there. A new ramp from H-2 is proposed to allow both transit vehicles and park-and-ride automobiles direct access into the proposed Pearl Highlands Station park-and-ride lot.

Another park-and-ride lot is planned near Aloha Stadium. For the Kamokila - Airport - Dillingham - King with a Waikīkī Branch and Kalaeloa - Airport - Dillingham -

Halekauwila combinations, as well as the 20-mile Alignment, this facility would be within the Aloha Stadium parking lot adjacent to the fixed guideway station. For the Kalaeloa - Salt Lake - North King - Hotel combination, the lot would be located at Salt Lake Boulevard and Kahuapa‘ani Street. The proposed size of the facilities, as indicated in Table 4-1, reflects the expected demand for their use as determined by the travel demand forecasting model.

Table 4-1. Park-and-Ride Lot Locations and Sizes for the Fixed Guideway Alternative Combination Alignments

Park-and-Ride Location	Kalaeloa - Salt Lake - North King - Hotel	Kamokila - Airport - Dillingham - King with a Waikīkī Branch	Kalaeloa - Airport - Dillingham - Halekauwila	20-mile Alignment East Kapolei to Ala Moana Center
Kapolei Parkway/Hanua Street	1,200 stalls	1,200 stalls	1,200 stalls	n/a
Saratoga Avenue/Renton Road/North-South Road	1,650 stalls	1,650 stalls	1,650 stalls	n/a
UH West O‘ahu at North-South Road, south of Farrington Highway	1,700 stalls	n/a	2,100 stalls	1,700 stalls
UH West O’ahu at Farrington Highway and Kapolei Golf Course Road	n/a	1,700 stalls	n/a	n/a
Ka Uka Boulevard and H-2 Freeway	1,000 stalls	1,000 stalls	1,000 stalls	1,000 stalls
Pearl Highlands (Kamehameha Highway/ Kuala Street)	1,500 stalls	1,500 stalls	1,500 stalls	1,500 stalls
Aloha Stadium	n/a	1,300 stalls	1,500 stalls	1,500 stalls
Salt Lake Boulevard/ Kahuapa‘ani Street	1,300 stalls	n/a	n/a	n/a

The supporting bus system would represent a 12 to 15 percent decrease in required fleet size as compared to the No Build Alternative, but would be similar to or a slight increase over the current bus fleet size (Table 1-1). This is in major contrast to both the TSM and Managed Lane Alternatives, which would require significant increases in bus fleet size.

Transit Travel Times

Table 4-2 shows the future estimated a.m. peak-period transit travel times between 10 selected study corridor location pairs, as well as for the existing year 2005. For added context, estimated single-occupant auto travel times for the existing year 2005 as well as the year 2030 No Build Alternative are also presented. The locations of the origins and destinations comprising the travel routes for which times are estimated are shown in Figure 4-1.

The transit travel time measures the amount of time required to complete a journey from origin to destination assuming that the journey was made on the transit system. The same zone pairs and peak period used in the non-transit analysis were also used for this transit analysis. For this analysis, the transit travel time is expressed in two modes: walk-to-transit and drive-to-transit. While both modes represent the transit trip, the distinction between the two is the mode of access to transit. Walk-to-transit is applicable to all zone pairs across each alternative and includes the walking time to the transit access point as well as the walk time from where the rider leaves the transit vehicle to their final destination. The drive-to-transit access mode is only applicable for trips where a park-and-ride facility is available and using it provides a travel time savings over the walk-to-transit mode, not necessarily for each zone pair or alternative; included is the drive time to the transit access point.

Alternative 1: No Build

As shown in Table 4-2, under the 2030 No Build Alternative, the walk-to-transit travel time into Downtown ranges between 51 minutes from the Pearlridge Center and 79 minutes from Wai‘anae. Travel from Downtown into the other identified destinations range between 18 minutes to the Ala Moana Center and 41 minutes to UH Mānoa. The trip between the Airport and Waikīkī is estimated at 72 minutes. The drive-to-transit travel time is only applicable for the Mililani Mauka to Downtown trip for these 10 selected trips; it is estimated to take 67 minutes.

Auto travel times for the No Build Alternative are either the same or longer than existing conditions between all origins and destinations selected, despite the fact that the “No Build” Alternative includes $3 billion of roadway improvements that are included in the ORTP. The No Build Alternative also results in longer travel times for transit trips for many of the selected pairs. Some transit travel times, such as from Wai‘anae to Downtown and from Mililani Mauka to Downtown, are projected to improve in the 2030 No Build Alternative. This is because these trips are able to take advantage of the extended HOV lanes on H-1; the improved operations of the zipper lane, which is assumed to be limited to three or more occupant vehicles by the year 2030; and/or the proposed Nimitz Flyover facility, which would give priority to HOVs and transit vehicles. Additionally, the transit travel time from Mililani Mauka to Downtown improves because it is assumed that bus service will be extended farther into the neighborhood, hence shortening walk access time.

Table 4-2. A.M. Peak-period Transit Travel Times by Alternative (in minutes)

Alternative	From Wai'anae To Downtown	From Kapolei To Downtown	From 'Ewa To Downtown	From Waipahu To Downtown	From Mililani Mauka To Downtown	From Pearlridge Center To Downtown	From Downtown To Ala Moana Center	From Downtown To Waikīkī	From Downtown To UH Mānoa	From Airport To Waikīkī
2005 Existing Conditions										
Walk-to-transit	87	65	68	53	90	46	18	32	31	70
Drive-to-transit*	N/A	N/A	N/A	N/A	67	N/A	N/A	N/A	N/A	N/A
Auto Travel Time	81	58	60	45	60	33	17	23	21	36
Alternative 1: 2030 No Build										
Walk-to-transit	79	68	67	69	78	51	18	34	41	72
Drive-to-transit	N/A	N/A	N/A	N/A	67	N/A	N/A	N/A	N/A	N/A
Auto Travel Time	83	62	70	53	60	35	17	24	22	38
Alternative 2: 2030 Transportation System Management										
Walk-to-transit	79	67	67	57	61	46	15	33	31	72
Drive-to-transit	68	57	59	N/A	57	41	N/A	N/A	N/A	N/A
Alternative 3: 2030 Managed Lane										
Two-direction Option										
Walk-to-transit	87	70	70	52	61	40	19	33	35	68
Drive-to-transit	74	63	65	N/A	53	N/A	N/A	N/A	N/A	N/A
Reversible Option										
Walk-to-transit	89	72	72	56	66	41	20	33	35	69
Drive-to-transit	75	65	67	N/A	58	N/A	N/A	N/A	N/A	N/A
Alternative 4: 2030 Fixed Guideway										
Kalaeloa - Salt Lake - North King - Hotel										
Walk-to-transit	79	51	59	34	55	29	13	28	24	63
Drive-to-transit	63	43	45	32	38	29	N/A	N/A	N/A	N/A
Kamokila - Airport - Dillingham - King with a Waikīkī Branch										
Walk-to-transit	79	54	72	39	59	33	15	21	28	31
Drive-to-transit	63	47	49	36	43	31	N/A	N/A	N/A	N/A
Kalaeloa - Airport - Dillingham - Halekauwila										
Walk-to-transit	85	55	66	41	61	35	17	40	28	42
Drive-to-transit	70	49	51	39	45	33	N/A	N/A	N/A	N/A
20-mile Alignment East Kapolei to Ala Moana Center										
Walk-to-transit	85	65	63	41	61	35	17	33	31	42
Drive-to-transit	66	49	50	39	45	33	N/A	N/A	N/A	N/A

* A drive-to-transit trip indicates a trip where the transit user drove to a park-and-ride lot to access transit.

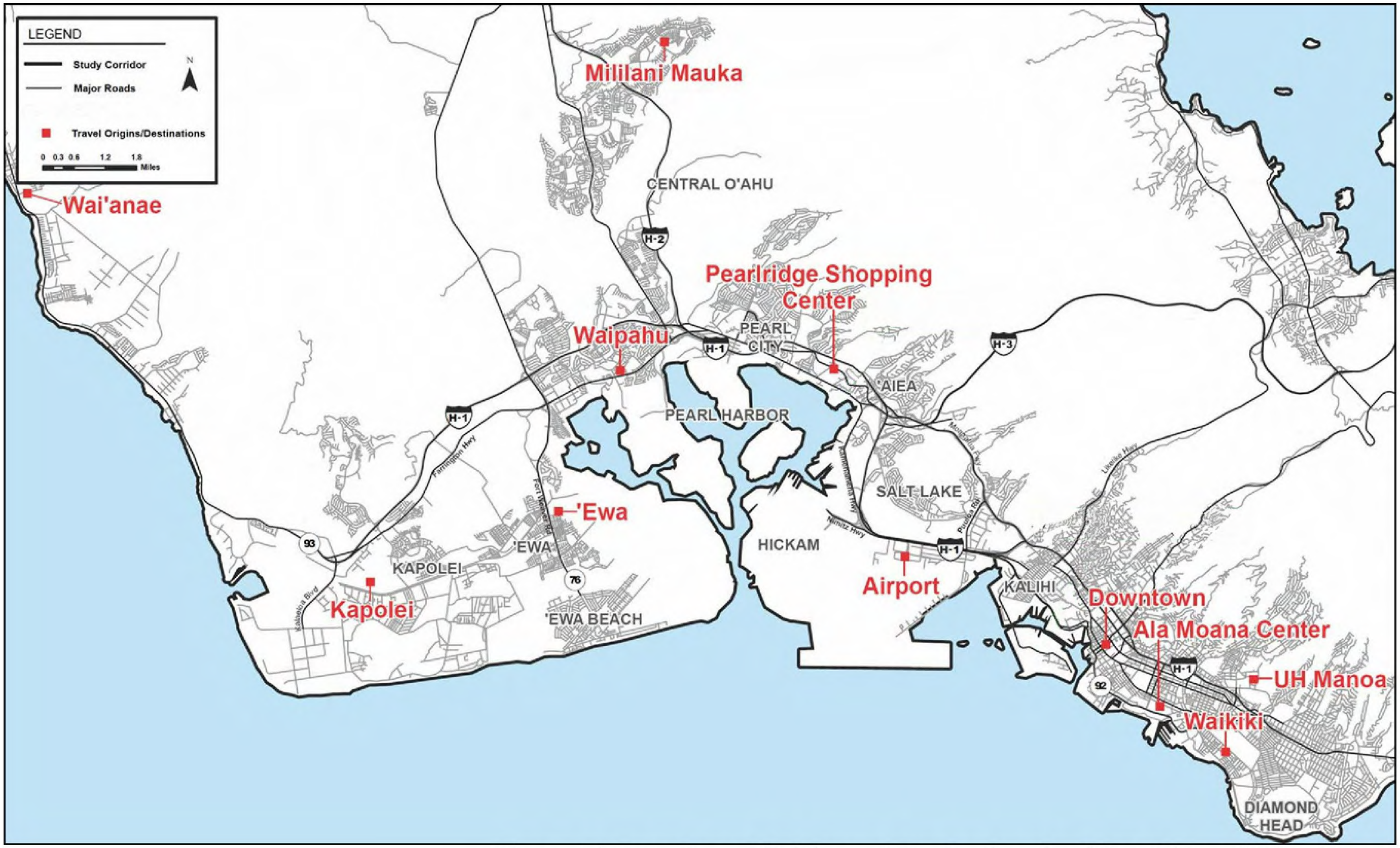

Figure 4-1. Locations of Origins and Destinations for Selected Travel Time Routes

Alternative 2: Transportation System Management

With the TSM Alternative, the walk-to-transit travel times into the Downtown area range from 46 minutes from Pearlridge Center to 79 minutes from the Wai‘anae area. For travel from Downtown to the identified destinations, the travel times vary between 15 minutes to the Ala Moana Center and 33 minutes into Waikīkī. The travel time between the Airport and Waikīkī is estimated at 72 minutes. The drive-to-transit travel time is applicable for all origin zones into Downtown, except for Waipahu. The transit travel times for this access mode range from 41 minutes from the Pearlridge Center to 68 minutes from the Wai‘anae area.

In comparison to the No Build, the walk-to-transit travel times exhibits a maximum improvement of 17 minutes from Mililani Mauka to Downtown. The walk-to-transit travel time improvements for the remaining zonal travel pairs range from unchanged up to 12 minutes. The drive-to-transit mode exhibits an improvement of 10 minutes over the No Build Alternative for the Mililani Mauka to Downtown trip.

Transit travel times for the year 2030 TSM Alternative are expected to generally improve over the No Build Alternative (Table 4-2). In most cases, the savings are due to the higher frequency of service and the shorter wait times for riders. Some locations experience larger travel-time benefits as a result of new express routes added for this alternative. The TSM Alternative also has a number of additional park-and-ride lots, and travel times would improve for those riders using these lots.

In general, travel-time benefits are moderate at best for the TSM Alternative as compared to the No Build. Table 4-2 shows that even by optimizing the bus system, only a marginal benefit in travel time would be gained because the constrained roadway network means that simply putting more buses on the road would not improve travel times in a majority of cases.

Alternative 3: Managed Lane

Table 4-2 shows that the Managed Lane Alternative options provide some transit travel time benefit for selected trips in comparison with the No Build and TSM Alternatives, but the majority of travel times either stays the same or gets worse. The Managed Lane Alternative options are projected to improve transit travel times for some origins and destination pairs that are particularly well served by the managed lane (e.g., Waipahu Transit Center to Downtown and Mililani to Downtown).

In general, however, the two Managed Lane options would increase traffic on the overall roadway system and create more delay for buses. Hence, while bus speeds on the managed lanes are projected to be relatively high, the H-1 Freeway leading up to the managed lanes is projected to become more congested in comparison to other alternatives as a result of more cars accessing the managed lanes. Additionally, significant congestion is anticipated to occur where the managed lanes connect to the Nimitz Highway at Pacific Street near Downtown. The Nimitz Highway is already projected to be over capacity at this point, and the addition of high volumes of traffic from the managed lanes would create extreme congestion and high levels of delay for all vehicles using the facility, including buses. Hence, much of the time saved on the managed lane itself would be negated by the time spent in congestion leading up to the managed lane as well as exiting the lanes at their Downtown terminus. These impacts are more pronounced with the Reversible Option as compared to the Two-direction Option because it attracts a higher volume of traffic in the peak direction and thus experiences greater congestion.

The primary beneficiaries of the travel-time improvements are users traveling from the vicinity of the ‘Ewa-side terminus into Downtown; the managed lane alignment provides access points serving communities in this area. Areas that are not directly served by the managed lane, such as from the Airport to Waikīkī, would not experience much change from the No Build or TSM Alternative projections. Hence, although the managed lane would provide some travel-time improvement for certain areas, it has significant limitations with regard to improving travel times or transit service for a broader customer base.

Two-direction Option

For the Two-direction Option, the walk-to-transit travel times into the Downtown area range from 40 minutes from the Pearlridge Center to 87 minutes from the Wai‘anae area. Travel times from Downtown vary between 19 minutes to the Ala Moana Center and 35 minutes into Waikīkī. The travel time between the Airport and Waikīkī is estimated at 68 minutes. The drive-to-transit travel time is applicable for all origin zones into Downtown, except for Waipahu and the Pearlridge Center; the drive access travel times range from 53 minutes from Mililani Mauka to 74 minutes from the Wai‘anae area.

In comparison to the No Build, the walk-to-transit travel times exhibits a maximum improvement of 17 minutes from Mililani Mauka to Downtown and from Waipahu to Downtown, while four other pairs also exhibit walk-to-transit travel-time improvements. The walk-to-transit travel times from Wai‘anae, Kapolei and ‘Ewa into Downtown do not improve. Although these trips would use the managed lane facility and speeds on the managed lanes are projected to be relatively high, the H-1 Freeway leading up to the managed lane is projected to be more congested than it would be for any of the other alternatives as more drivers are trying to access the managed lane facility.

The drive-to-transit mode exhibits an improvement of 14 minutes over the No Build Alternative for travel from Mililani Mauka to Downtown. The remaining zones for drive-to-transit access do not have a point of comparison against the No Build Alternative.

Reversible Option

For the Reversible Option, the walk-to-transit travel times into the Downtown area range from 41 minutes from Pearlridge Center to 89 minutes from the Wai‘anae area. Travel times from Downtown vary between 20 minutes to Ala Moana Center and 35 minutes into Waikīkī. The travel time between the Airport and Waikīkī is estimated at 69 minutes. The drive-to-transit travel time is applicable for all origin zones into

Downtown, except for Waipahu and the Pearlridge Center; the drive access travel times range from 58 minutes from Mililani Mauka to 75 minutes from the Wai‘anae area.

In comparison to the No Build, the walk-to-transit travel times exhibits a maximum improvement of 13 minutes from Waipahu to Downtown and 12 minutes from Mililani Mauka to Downtown, while four other pairs also exhibit walk-to-transit travel-time improvements. The walk-to-transit travel times from Wai‘anae, Kapolei, and ‘Ewa into Downtown do not improve. Although these trips would use the managed lane facility and speeds on the managed lanes are projected to be relatively high, the H-1 Freeway leading up to the managed lane is projected to be more congested than it would be for any of the other alternatives as more drivers are trying to access the managed lane facility. The drive-to-transit mode improves nine minutes over the No Build Alternative for travel from Mililani Mauka into Downtown. The remaining zones for drive-to-transit access do not have a point of comparison against the No Build Alternative.

Alternative 4: Fixed Guideway

In general, the four Fixed Guideway options provide the fastest transit travel times of all the alternatives and are often either as fast as, or faster than, projected auto travel time for the No Build Alternative (Table 4-2). In particular, “drive-to-transit” trips (i.e., park-and-ride transit trips) provide significant savings from several locations (e.g., Wai‘anae, ‘Ewa, and Mililani).

Kalaeloa – Salt Lake – North King – Hotel Combination

Among the Fixed Guideway Alternative options, the Kalaeloa – Salt Lake – North King – Hotel Combination would result in slightly faster travel times from the Leeward side to Downtown because of a shorter alignment through the Salt Lake community as opposed to traveling past the Airport and a more central location Downtown (i.e., Hotel Street rather than Halekauwila Street). However, trips from the Airport would be significantly longer for this option as compared to the others.

For this combination, the walk-to-transit travel times into the Downtown area range from 29 minutes from the Pearlridge Center to 79 minutes from the Wai‘anae area. Travel times from Downtown vary between 13 minutes to the Ala Moana Center and 28 minutes to Waikīkī. The travel time between the Airport and Waikīkī is estimated at 63 minutes. The drive-to-transit travel time is applicable for all origin zones into Downtown; these drive access travel times range from 29 minutes from Pearlridge Center to 63 minutes from the Wai‘anae area.

In comparison to the No Build, the walk-to-transit travel times exhibit a maximum improvement of 35 minutes from Waipahu into Downtown. The walk-to-transit travel-time improvements for the remaining zonal travel pairs range from unchanged to up to 23 minutes. The drive-to-transit mode exhibits an improvement of 29 minutes over the No Build Alternative for travel from Mililani Mauka into Downtown.

Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination

The Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination generally shows similar benefits for transit as the Kalaeloa – Salt Lake – North King – Hotel Combination, although it is a few minutes slower for many trips because of the longer alignment that serves the Airport. However, since this alignment provides direct service to Waikīkī, transit travel times to and from Waikīkī are expected to be much faster than all other alternatives and options.

For this combination, the walk-to-transit travel times into the Downtown area range from 33 minutes from Pearlridge Center to 79 minutes from the Wai‘anae area. Travel times from Downtown vary between 15 minutes to Ala Moana Center and 28 minutes into UH Mānoa. The travel time between the Airport and Waikīkī is estimated at 31 minutes. The drive-to-transit travel time is applicable for all origin zones into Downtown; these drive access travel times range from 31 minutes from Pearlridge Center to 63 minutes from the Wai‘anae area.

Compared to the No Build, the walk-to-transit travel times exhibit a maximum improvement of 41 minutes from the Airport into Waikīkī. The walk-to-transit travel time impacts for the remaining zonal travel pairs range from a five minute travel-time loss to a 30-minute travel-time savings. The drive-to-transit mode exhibits an improvement of 24 minutes over the No Build Alternative for travel from Mililani Mauka into Downtown.

Kalaeloa – Airport – Dillingham – Halekauwila Combination

The Kalaeloa – Airport – Dillingham – Halekauwila Combination also has similar patterns to the other combinations. However, because of the longer alignment makai into Kalaeloa along Saratoga Avenue, as well as the location of stations on the edge of Downtown (e.g., Nimitz Highway/Fort Street and South Street/Halekauwila Street) rather than in the center of Downtown, walk-to-transit travel times from Wai‘anae would be longer than transit travel times for the No Build Alternative; however, drive-to-transit travel times are shorter.

For this combination, the walk-to-transit travel times into the Downtown area range from 35 minutes from Pearlridge Center to 85 minutes from the Wai‘anae area. Travel times from Downtown vary between 17 minutes to Ala Moana Center and 40 minutes into Waikīkī. The travel time between the Airport and Waikīkī is estimated at 42 minutes. The drive-to-transit travel time is applicable for all origin zones into Downtown; these drive access travel times range from 33 minutes from Pearlridge Center to 70 minutes from the Wai‘anae area.

In comparison to the No Build, the walk-to-transit travel times exhibit a maximum improvement of 30 minutes from the Airport to Waikīkī. The walk-to-transit travel time impacts for the remaining zonal travel pairs range from a loss of six minutes to 28 minutes in travel-time savings. The drive-to-transit mode exhibits an improvement of 22 minutes over the No Build Alternative for travel from Mililani Mauka into Downtown.

20-mile Alignment

Other than the Kapolei to Downtown walk-to-transit travel time, which is 10 to 14 minutes longer, the 20-mile Alignment generally shows the same pattern as the other Fixed Guideway Alternative combinations. Even with a shorter overall service length and some longer travel times as compared to the Full-corridor Alignments, the 20-mile Alignment provides transit service times that compare favorably to the other alternatives and are competitive with the 2030 auto travel times in most cases.

With the 20-mile Alignment, the walk-to-transit travel times into the Downtown area range from 35 minutes from Pearlridge Center to 85 minutes from the Wai‘anae area. Travel times from Downtown vary between 17 minutes to Ala Moana Center and 33 minutes into Waikīkī. The travel time between the Airport and Waikīkī is estimated at 42 minutes. The drive-to-transit travel time is applicable for all origin zones into Downtown; these drive access travel times range from 33 minutes from Pearlridge Center to 66 minutes from the Wai‘anae area.

Compared to the No Build, the walk-to-transit travel times exhibit a maximum improvement of 30 minutes from the Airport to Waikīkī. The walk-to-transit travel time impacts for the remaining zonal travel pairs range from a loss of six minutes (Wai‘anae to Downtown) to 28 minutes in travel-time savings. The drive-to-transit mode exhibits an improvement of 22 minutes over the No Build Alternative for travel from Mililani Mauka into Downtown.

Transit Travel Times versus Auto Travel Times

The comparison of auto travel times with transit travel times is meant to provide an indicator of the performance of the transit system between the selected origins and destinations. The auto travel times presented in the non-transit travel time discussion are compared against the two access modes to transit. Estimated auto travel times for single-occupant vehicles for the No Build Alternative are the basis for comparison. Below is a summary of this comparison; the remaining travel pairs are detailed in Table 4-2.

Non-Transit Travel Times

The non-transit travel time expresses the projected amount of time to complete a journey for an origin-destination pair. This value is derived from the zone-to-zone travel time by the auto mode and is expressed in terms of minutes required to complete travel. The a.m. peak period was selected for this analysis. A series of 10 zonal pairs (origin and destination) in the Travel Demand Forecasting Model were selected to evaluate the non-transit travel time. Five origin zones traveling into Downtown have been identified: Wai‘anae, Kapolei, ‘Ewa, Waipahu, Mililani Mauka, and Pearlridge Center. Three destination zones traveling from Downtown have been identified: Ala Moana Center, Waikīkī, and UH Mānoa. One additional zone pair was identified for travel within the PUC: the Airport to Waikīkī. These zone pairs are summarized in Table 4-2.

The auto travel time under the 2030 No Build Alternative is projected to range from 35 minutes to 83 minutes for travel into Downtown. Travel from Wai‘anae is projected at 83 minutes, Kapolei at 62 minutes, ‘Ewa at 70 minutes, Waipahu at 53 minutes, Mililani

Mauka at 60 minutes, and Pearlridge Center at 35 minutes. For reference, these travel times indicate a slight increase over existing conditions.

For travel within the PUC, auto travel times range from 17 minutes to 38 minutes. To Ala Moana Center, travel time is projected to be 17 minutes; travel into Waikīkī and UH Mānoa is projected at 24 and 22 minutes, respectively. The journey from the Airport into Waikīkī is projected at 38 minutes.

Alternative 1: No Build

In comparison to auto travel times, transit trips in the No Build Alternative experience higher travel times for many of the selected pairs. Although there is a high level of roadway improvements in the No Build, there is also a high level of projected congestion. For the pairs that exhibit travel-time improvements, this is because the trips are able to take advantage of the extended HOV lanes on H-1 and/or the improved operations of the zipper lane, which is assumed to be limited to vehicles with three or more occupants by the year 2030.

Alternative 2: Transportation System Management

Although the TSM Alternative includes a series of improvements to the transit system, selected travel pairs do not show improvement in the walk-to-transit travel times compared to auto travel times. While walk-to-transit only exhibits marginal improvements, the drive-to-transit travel times show greater improvement from the auto travel time. Drivers with the ability to access the newly added park-and-ride lots would likely see greater improvement in their transit travel time. Although the alternative provides improvements to optimize the transit system, the projected congestion on the road network effectively reduces the benefits of the improved transit service.

Alternative 3: Managed Lane

Two-direction Option

The walk-to-transit travel times for the Two-direction Option largely do not show significant improvement over the auto travel times. This is likely related to service area and access points to the managed lane facility. Any travel-time benefits realized by using the managed lane facility is lost to the time spent accessing and egressing the facility on congested roadways. Conversely, some improvement is seen in the drive-to-transit travel time when compared to auto travel times; these travel improvements range from five minutes to nine minutes depending upon origin location.

Reversible Option

The walk-to-transit travel times for the Reversible Option also do not show significant improvement over the projected auto travel times. The level of increased walk-to-transit travel time is greater compared to the Two-direction Option. This is likely related to service area and access points to the managed lane facility. Any travel-time benefits realized by using the managed lane facility is lost to the time spent accessing the facility on congested roadways. Conversely, some improvement is seen in the drive-to-transit travel time when compared to auto travel times; these travel improvements range from two minutes to eight minutes depending upon origin location.

Alternative 4: Fixed Guideway

Kalaeloa – Salt Lake – North King – Hotel Combination

Most of the walk-to-transit travel times for this combination show improvement over auto travel times for travel into Downtown. The range of this improvement is between four minutes and 19 minutes, affecting all six trips to Downtown. Within Downtown, only the trip to Ala Moana Center exhibits an improved travel time by four minutes compared to auto travel time. The drive-to-transit travel times show an even greater improvement compared to auto travel time; these improvements range from six minutes to 25 minutes and also apply to all trips into Downtown. These travel-time improvements are due to the fixed guideway system in the transit network.

Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination

Similar to the combination above, the Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination also shows improvement over the auto travel time for travel into Downtown for most originating zones. The range of this improvement is between one and 14 minutes, affecting five of the six zone pairs. Three of the four zonal pairs in the Downtown area also exhibit an improved transit time versus auto travel time; these improvements are related to the route of the alignment and the direct service into Waikīkī. Again, the drive-to-transit travel times show improvement compared to the auto time; these improvements range from four minutes to 21 minutes and apply to all of the selected trips into Downtown. These travel-time improvements are due to the fixed guideway system in the transit network.

Kalaeloa – Airport – Dillingham – Halekauwila Combination

The walk-to-transit travel times for this combination generally show improvement over auto travel times for trips into Downtown. Compared to the other Fixed Guideway combinations, the range of the improvement is lower, four minutes to 12 minutes and affecting three zone pairs. Within the Downtown area, no improvements in transit travel time are projected versus auto travel time. The drive-to-transit travel times show improvement compared to auto travel time; these improvements range from two to 19 minutes and apply to all trips into Downtown. These travel-time improvements are due to the fixed guideway system in the transit network.

20-mile Alignment

For the 20-mile Alignment, the walk-to-transit travel times generally show improvement over auto travel times for trips into Downtown. Compared to the other combination alignments, the range of the improvement is lower, seven minutes to 12 minutes and affecting two zone pairs, due to the shorter length of this alignment. Within the Downtown area, no improvements in transit travel time are projected compared to auto travel time. The drive-to-transit travel times show a greater degree of improvement compared to auto travel time; these improvements range from two minutes to 20 minutes and apply to all origin zones into Downtown. These travel-time improvements are due to the fixed guideway system in the transit network.

Transit Ridership

Table 4-3 and Figure 4-2 present daily transit ridership for year 2005 as well as forecasted values for each of the year 2030 alternatives. Table 4-4 shows estimated a.m. peak two-hour ridership. The ridership numbers are presented in terms of bus or fixed guideway trips, as well as in terms of total boardings. Note that the number of transit vehicle boardings is higher than the number of total trips because many trips require transfers between buses or between buses and fixed guideway vehicles, resulting in multiple boardings for the same trip.

Alternative 1: No Build

The No Build Alternative is forecast to have the lowest year 2030 transit ridership of any of the alternatives, as shown in Table 4-3 and Table 4-4. Ridership under the No Build Alternative is expected to keep pace with population growth and increase over the 2005 existing conditions by approximately 30 percent. Transit boardings are projected to increase at a higher pace, primarily reflecting additional transfers in the system (about 7.4% more) that would result from route restructuring to focus on transit hubs throughout the network. Table 4-5 shows the a.m. peak period transit trips occurring between the 25 TAAs for the No Build Alternative. The table indicates that the majority of a.m. peak-period transit trips are relatively short trips and stay within the TAA they originate in or terminate in the adjacent TAA. This suggests that transit in the No Build Alternative is not conducive to longer trips, which is likely due to the slow travel times experienced as a result of the congested roadway network.

Alternative 2: Transportation System Management

Transit ridership for the TSM Alternative is expected to increase over the No Build Alternative by approximately 5.1 percent in terms of transit trips and by 7.6 percent in terms of boardings, as shown in Table 4-3. The increase in transit trips is a reflection of the enhanced transit service provided by the alternative, whereas the slightly higher increase in boardings reflects a higher number of transfers that would likely result from the increased use of transit hubs. The TSM Alternative results in an overall increase of 2,250 in a.m. peak-period trips, or 5.9 percent (Table 4-4). Table 4-6 shows the difference between the a.m. peak-period transit trips between the 25 TAAs for the TSM Alternative as compared to the No Build Alternative. The largest increase in absolute numbers of trips is in the ‘Ewa and Kapolei areas (TAAs 11 and 12). Similar to the pattern exhibited for the No Build Alternative, these trips are primarily short trips with destinations either within the TAA of origin or immediately adjacent to it.

Table 4-3. Daily Transit Ridership

Alternative	Fixed Guideway Trips	Total Transit Trips	Total Transit Boardings
2005 Existing Conditions			
Existing Conditions	NA	178,400	236,600[1]
Alternative 1: No Build			
No Build Alternative	NA	232,100	330,600
% Change from Existing Conditions	—	30%	40%
Alternative 2: Transportation System Management			
TSM Alternative	NA	243,100	354,200
% Change from No Build Alternative	—	4.7%	7.1%
Alternative 3: Managed Lane			
Two-direction Option	NA	247,000	359,400
% Change from No Build Alternative	—	6.4%	8.7%
Reversible Option	NA	247,400	362,100
% Change from No Build Alternative	—	6.5%	9.5%
Alternative 4: Fixed Guideway			
Kalaeloa – Salt Lake – North King – Hotel	128,500	293,600	468,800
% Change from No Build Alternative	—	27%	42%
Kamokila – Airport – Dillingham – King with a Waikīkī Branch	122,500	287,800	449,300
% Change from No Build Alternative	—	24%	36%
Kalaeloa – Airport – Dillingham – Halekauwila	123,700	294,100	468,300
% Change from No Build Alternative	—	27%	42%
20-mile Alignment East Kapolei to Ala Moana Center	95,000	281,900	455,300
% Change from No Build Alternative	—	21%	38%

[1]Observed number of boardings from on-board transit survey conducted in December 2005/January 2006. The travel demand forecasting model estimated this value at 243,100, which is within three percent of the observed value.

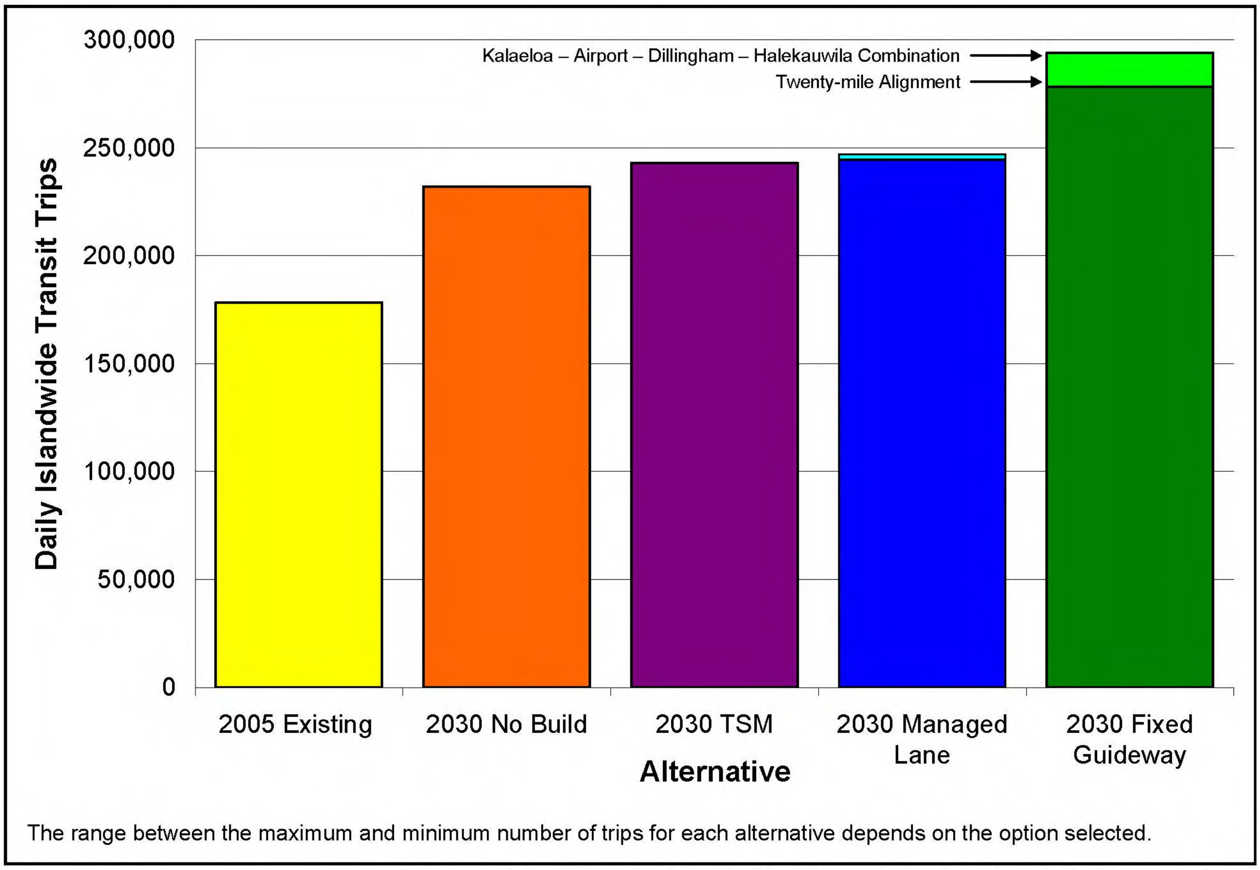

Figure 4-2. Islandwide Daily Transit Trips for All Alternatives

Table 4-4. A.M. Peak Two-hour Transit Ridership

Alternative	Transit Trips	% Change from No Build
2005 Existing Conditions		
Existing Conditions	29,110	N/A
Alternative 1: 2030 No Build		
No Build Alternative	37,970	N/A
Alternative 2: 2030 Transportation System Management		
TSM Alternative	40,220	5.9%
Alternative 3: 2030 Managed Lane		
Two-direction Option	41,220	8.6%
Reversible Option	41,300	8.7%
Alternative 4: 2030 Fixed Guideway		
Kalaeloa – Salt Lake – North King – Hotel	50,730	34%
Kamokila – Airport – Dillingham – King with a Waikīkī Branch	49,280	30%
Kalaeloa – Airport – Dillingham – Halekauwila	50,600	33%
20-mile Alignment East Kapolei to Ala Moana Center	48,110	27%

Alternative 3: Managed Lane

Transit ridership for the two Managed Lane Alternative options is expected to increase over the No Build Alternative by 14,900 to 15,300 daily transit trips or approximately 6.4 to 6.5 percent, as shown in Table 4-3**.** This is a very small increase (1.6 to 1.7 percent) over the ridership projected for the TSM Alternative. Regarding the change in a.m. peak-period transit trips (Table 4-4), the Managed Lane Alternative options show an increase in overall trips of 3,250 (8.6 percent) and 3,350 (8.7 percent) as compared to the No Build Alternative for the Two-direction Option and Reversible Option, respectively. These increases are slightly more than the increase exhibited by the TSM Alternative. Table 4-7 and Table 4-8 show the difference between the a.m. peak-period transit trips between the 25 TAAs for the two managed lane options as compared to the No Build Alternative. The Managed Lane Alternative tends to do a slightly better job of facilitating longer transit trips than either the No Build or TSM Alternatives; for example, Waikīkī is experiencing a relatively high number of additional transit trips to it from places such as Honouliuli-'Ewa Beach and Waiawa-Koa Ridge.

Alternative 4: Fixed Guideway

Daily transit ridership for the Fixed Guideway Alternative is expected to increase over the No Build Alternative by approximately 24 to 27 percent for the Full-corridor Alignments and by 21 percent for the 20-mile Alignment, as shown in Table 4-3. This is a substantially greater increase in ridership as compared to either the TSM or Managed Lane Alternatives. Of the three combination alignment options, Kalaeloa - Airport - Dillingham – Halekauwila is projected to have the most systemwide daily transit trips at 294,100. Total daily transit boardings increase by 36 to 42 percent compared to the No Build Alternative, which is a greater rate than transit trips because of the transfer activity that would occur between the bus and fixed guideway modes. Note that even the 20-mile Alignment attracts significantly more transit trips and boardings than any of the non-Fixed Guideway alternatives.

The fixed guideway system would provide the greatest benefit to transit users in terms of overall a.m. peak-period transit use and connectivity within the study corridor. In particular, Table 4-9, Table 4-10, Table 4-11, and Table 4-12 show that across all of the fixed guideway combinations, there is a large increase in the number of long-distance transit trips made. Transit trips made to the TAA 1, Ward-Chinatown and TAA 4 Waikīkī increase by two times or more from TAA 10, ‘Aiea – Pearl City; TAA 11, ‘Ewa – Honouliuli; TAA 12, Kapolei – Ko'Olina – Kalaeloa; and TAA 15, Waiawa – Koa Ridge. These areas are high-demand destinations for the transit market in the non-fixed guideway alternatives as well, however, with the fixed guideway, transit is used to get to them from much farther distances. Access to UH Mānoa from points west is also greatly increased, particularly from TAA 11, ‘Ewa – Honouliuli and TAA 12, Kapolei – Ko'Olina – Kalaeloa. There is also a large increase in transit trips from all areas to TAA 12, Kapolei – Ko ‘Olina – Kalaeloa, which illustrates that the fixed guideway would support the increase in commute trips within the corridor destined for West O‘ahu.

Table 4-5. No Build Alternative A.M. Peak-period Transit Trips between Origin-Destination Pairs

Origin	Destination																									Total
	1. Ward-Chinatown	2. Kaka 'ako	3. Punchbowl-Sheridan-Date	4. Waikīkī	5. Kāhala- Tantalus	6. Pauoa-Kalihi	7. Iwilei-Māpunapuna-Airport	8. Hickam-Pearl Harbor	9. Moanalua-Hālawa	10. 'Aiea-Pearl City	11. Honouliuli - 'Ewa Beach	12. Kapolei-Ko 'Olina - Kalaeloa	13. Makakilo - Makaiwa	14. Waipahu - Waikele - Kunia	15. Waiawa-Koa Ridge	16. Mililani - Meleman-Kīpapa	17. Wahiawā-Whitmore-Schofield	18. East Honolulu	19. Kāne'ohe - Kahalu'u - Kualoa	20. Kailua - Mokapu-Waimānalo	21. Ko'olauloa	22. North Shore	23. Wai'anae Coast	24. Mānoa - Tantalus	25. University	
1. Ward-Chinatown	238	165	197	122	84	164	177	71	93	29	9	13	3	13	3	13	6	18	16	34	6	3	10	45	79	**1,611**
2. Kaka 'ako	324	150	246	210	109	148	175	56	55	21	7	8	2	9	2	7	1	22	10	18	3	2	2	79	72	**1,738**
3. Punchbowl-Sheridan-Date	722	278	328	315	333	115	199	63	68	33	3	9	3	8	11	9	4	53	9	21	6	3	9	135	185	**2,922**
4. Waikīkī	651	227	359	309	258	67	119	79	38	24	12	6	7	12	6	5	3	47	12	10	2	9	6	77	107	**2,452**
5. Kāhala- Tantalus	349	131	292	292	333	52	90	29	35	12	2	7	1	7	2	4	5	84	8	11	0	2	1	81	147	**1,977**
6. Pauoa-Kalihi	499	143	121	83	60	259	380	98	141	43	2	14	0	15	6	5	4	7	29	24	5	3	4	35	61	**2,041**
7. Iwilei-Māpunapuna-Airport	242	102	84	42	38	143	159	99	106	32	3	12	1	12	6	6	4	8	14	9	2	2	1	25	46	**1,198**
8. Hickam-Pearl Harbor	61	14	17	20	10	19	49	80	66	30	8	8	1	16	6	5	3	2	3	9	3	1	4	4	9	**448**
9. Moanalua-Hālawa	206	51	55	31	34	67	141	206	360	103	9	18	1	32	15	5	7	3	16	14	2	0	5	11	53	**1,445**
10. 'Aiea-Pearl City	180	47	45	30	30	50	130	224	261	479	24	56	1	144	70	41	29	4	18	12	8	3	13	8	86	**1,993**
11. Honouliuli - 'Ewa Beach	180	63	78	208	56	61	80	95	88	145	523	494	28	176	23	31	31	17	19	22	24	5	68	37	171	**2,723**
12. Kapolei-Ko 'Olina - Kalaeloa	127	43	55	132	45	48	68	58	77	112	182	605	47	108	16	26	18	14	18	17	21	5	176	34	163	**2,215**
13. Makakilo - Makaiwa	65	25	31	68	22	36	35	33	42	58	33	179	23	29	5	8	9	8	7	16	13	0	85	19	68	**917**
14. Waipahu - Waikele - Kunia	114	31	63	151	27	35	50	63	67	158	97	119	7	315	68	94	42	8	9	15	10	2	18	19	79	**1,661**
15. Waiawa-Koa Ridge	93	21	49	103	20	17	37	46	48	173	18	46	4	143	116	158	88	4	5	10	7	7	6	12	63	**1,294**
16. Mililani - Meleman-Kīpapa	140	39	47	40	24	26	62	67	52	81	18	41	7	89	87	462	298	7	8	12	11	16	5	14	96	**1,749**
17. Wahiawā-Whitmore-Schofield	72	26	18	23	15	12	29	28	20	26	5	19	0	35	26	157	252	2	5	6	6	18	4	8	73	**885**
18. East Honolulu	237	75	130	129	227	37	66	32	24	15	1	3	1	3	2	4	3	256	15	34	4	1	5	40	119	**1,463**
19. Kāne'ohe - Kahalu'u - Kualoa	228	57	48	44	24	55	88	46	55	29	3	9	2	6	5	3	4	5	356	113	36	3	3	9	73	**1,304**
20. Kailua - Mokapu-Waimānalo	313	78	58	52	48	55	79	51	46	30	5	15	3	16	7	2	3	13	117	503	9	1	2	12	82	**1,600**
21. Ko'olauloa	43	13	14	17	7	8	10	15	9	4	4	1	0	3	2	3	2	4	13	5	222	11	1	3	18	**432**
22. North Shore	55	16	22	20	9	10	21	20	15	15	3	4	0	7	10	24	59	2	8	1	49	163	4	7	47	**591**
23. Wai'anae Coast	152	52	63	74	33	24	61	80	45	29	19	147	10	38	6	6	11	4	6	18	2	0	462	15	123	**1,480**
24. Mānoa - Tantalus	382	153	207	155	127	79	117	37	43	13	1	7	1	7	3	2	4	18	7	14	2	0	4	87	96	**1,566**
25. University	59	18	41	30	25	10	13	7	3	3	4	3	2	4	1	3	1	6	3	4	0	1	3	16	2	**262**
Total	**5,732**	**2,018**	**2,668**	**2,700**	**1,998**	**1,597**	**2,435**	**1,683**	**1,857**	**1,697**	**995**	**1,843**	**155**	**1,247**	**504**	**1,083**	**891**	**616**	**731**	**952**	**453**	**261**	**901**	**832**	**2,118**	**37,967**

Table 4-6. Difference between TSM Alternative and No Build Alternative A.M. Peak-period Transit Trips between Origin-Destination Pairs

Origin	Destination																									Total
	1. Ward-Chinatown	2. Kaka 'ako	3. Punchbowl-Sheridan-Date	4. Waikīkī	5. Kāhala- Tantalus	6. Pauoa-Kalihi	7. Iwilei-Māpunapuna-Airport	8. Hickam-Pearl Harbor	9. Moanalua-Hālawa	10. 'Aiea-Pearl City	11. Honouliuli - 'Ewa Beach	12. Kapolei-Ko 'Olina - Kalaeloa	13. Makakilo - Makaiwa	14. Waipahu - Waikele - Kunia	15. Waiawa-Koa Ridge	16. Mililani - Meleman-Kīpapa	17. Wahiawā-Whitmore-Schofield	18. East Honolulu	19. Kāne'ohe - Kahalu'u - Kualoa	20. Kailua - Mokapu-Waimānalo	21. Ko'olauloa	22. North Shore	23. Wai'anae Coast	24. Mānoa - Tantalus	25. University	
1. Ward-Chinatown	-3	5	8	-5	5	9	-1	-2	-6	6	3	-3	2	5	3	-2	-2	0	5	11	-4	-1	-1	12	-10	**34**
2. Kaka 'ako	1	6	5	-4	6	-1	0	-2	2	-1	0	-1	0	-1	2	-1	4	1	4	5	-2	-1	-1	11	0	**32**
3. Punchbowl-Sheridan-Date	7	16	25	-7	7	1	6	2	-1	-4	2	1	-1	4	-3	3	0	1	2	17	1	0	-5	6	-3	**77**
4. Waikīkī	0	-4	-1	-9	5	-4	3	-5	2	1	-1	5	-2	0	3	-1	1	-3	3	7	2	1	0	0	7	**10**
5. Kāhala- Tantalus	13	3	4	1	17	7	-5	2	-3	0	2	4	-1	2	-1	0	-2	2	-2	4	4	-2	3	20	-10	**62**
6. Pauoa-Kalihi	11	4	2	6	-7	18	-5	9	-11	4	4	-2	3	0	5	0	-1	2	9	5	-2	-3	1	6	8	**66**
7. Iwilei-Māpunapuna-Airport	2	-1	11	2	-1	-2	-1	-2	-6	6	-2	1	4	2	-3	3	1	-1	-1	7	0	0	1	5	-1	**24**
8. Hickam-Pearl Harbor	1	-2	2	3	-5	3	-1	-7	8	3	2	-2	2	4	1	-1	0	2	0	1	-1	2	-1	1	1	**16**
9. Moanalua-Hālawa	-7	-2	-3	0	-4	5	0	9	19	1	0	-1	1	4	-2	0	-1	4	0	6	2	1	1	-2	2	**33**
10. 'Aiea-Pearl City	13	4	6	10	10	4	10	3	-4	59	0	6	4	16	-1	7	4	-1	7	16	8	1	-7	4	7	**186**
11. Honouliuli - 'Ewa Beach	35	16	17	38	15	11	18	12	3	24	90	152	7	34	5	5	0	-1	6	22	6	1	7	11	37	**571**
12. Kapolei-Ko 'Olina - Kalaeloa	13	7	9	16	7	5	5	20	-4	12	24	140	19	9	4	2	5	1	3	19	5	0	12	5	29	**367**
13. Makakilo - Makaiwa	1	1	5	10	9	-1	-5	7	0	2	4	23	5	4	4	2	-1	-1	5	7	6	1	-1	6	6	**99**
14. Waipahu - Waikele - Kunia	13	-3	11	23	6	-1	11	-5	0	9	-4	5	3	30	11	-2	4	-3	5	8	8	5	1	7	2	**144**
15. Waiawa-Koa Ridge	18	4	10	34	2	6	3	7	6	6	5	7	-1	30	18	41	18	0	6	2	5	1	2	-2	13	**241**
16. Mililani - Meleman-Kīpapa	14	4	0	7	6	-1	5	-5	-3	15	2	10	-6	5	16	21	12	0	2	15	0	2	2	-4	8	**127**
17. Wahiawā-Whitmore-Schofield	1	-1	5	0	1	-4	4	1	-1	3	0	2	1	-1	3	2	6	1	0	1	5	2	-1	0	-3	**27**
18. East Honolulu	4	-9	19	-8	7	-2	-4	1	-4	5	0	4	-1	-2	3	-2	0	19	-2	2	5	0	-3	7	-4	**35**
19. Kāne'ohe - Kahalu'u - Kualoa	-19	-7	1	-4	-3	3	0	10	-15	16	1	-1	0	5	0	1	1	-3	23	38	-3	0	0	-1	-15	**28**
20. Kailua - Mokapu-Waimānalo	2	-8	5	0	-11	3	6	1	-4	2	0	-2	0	4	1	1	3	4	2	68	-1	1	5	3	1	**86**
21. Ko'olauloa	2	1	1	1	-1	0	4	-1	-3	0	-2	3	2	3	1	-2	2	-2	0	5	8	1	-1	0	6	**28**
22. North Shore	2	3	0	2	3	3	5	-2	0	-4	0	3	0	1	-1	3	5	1	-3	7	-2	4	0	-1	4	**33**
23. Wai'anae Coast	-1	-4	2	-5	0	6	-4	0	-1	-5	3	5	-1	-4	7	3	-1	2	1	6	1	1	7	-4	-4	**10**
24. Mānoa - Tantalus	20	12	6	11	7	6	4	2	-6	4	0	0	0	1	1	0	0	2	3	10	2	0	-3	13	18	**113**
25. University	0	2	1	0	3	-2	0	-1	1	3	1	1	0	-3	2	0	1	-1	-1	1	1	0	-1	2	0	**10**
Total	**143**	**47**	**151**	**122**	**84**	**72**	**58**	**54**	**-31**	**167**	**134**	**360**	**40**	**152**	**79**	**83**	**59**	**26**	**77**	**290**	**54**	**17**	**17**	**105**	**99**	**2,459**

Table 4-7. Difference between Managed Lane Alternative Two-direction Option and No Build Alternative A.M. Peak-period Transit Trips between Origin-Destination Pair

	Destination																									
Origin	1. Ward-Chinatown	2. Kaka 'ako	3. Punchbowl-Sheridan-Date	4. Waikīkī	5. Kāhala- Tantalus	6. Pauoa-Kalihi	7. Iwilei-Māpunapuna-Airport	8. Hickam-Pearl Harbor	9. Moanalua-Hālawa	10. 'Aiea-Pearl City	11. Honouliuli - 'Ewa Beach	12. Kapolei-Ko 'Olina - Kalaeloa	13. Makakilo - Makaiwa	14. Waipahu - Waikele - Kunia	15. Waiawa-Koa Ridge	16. Mililani - Meleman-Kīpapa	17. Wahiawā-Whitmore-Schofield	18. East Honolulu	19. Kāne'ohe - Kahalu'u - Kualoa	20. Kailua - Mokapu-Waimānalo	21. Ko'olauloa	22. North Shore	23. Wai'anae Coast	24. Mānoa - Tantalus	25. University	**Total**
1. Ward-Chinatown	-7	14	1	-4	3	11	7	-3	-14	4	-3	3	-1	6	5	1	-1	5	9	2	-3	-2	2	15	-11	**39**
2. Kaka 'ako	10	6	5	4	14	-9	2	4	-6	-1	2	-3	-1	4	3	-3	2	3	8	4	-3	-1	0	18	-1	**61**
3. Punchbowl-Sheridan-Date	23	17	38	4	6	3	3	7	0	1	1	3	-3	8	-1	-5	2	-1	5	10	0	2	-5	2	7	**127**
4. Waikīkī	3	-5	3	-9	9	-1	5	-7	2	3	3	3	-5	8	4	-2	0	1	1	11	2	1	0	-1	-6	**23**
5. Kāhala- Tantalus	27	8	28	6	23	0	-3	1	1	5	-1	4	-1	6	3	-2	-4	6	3	-1	2	-2	0	21	-10	**120**
6. Pauoa-Kalihi	7	12	4	3	5	15	1	22	-20	12	1	0	3	0	1	2	0	-1	5	5	-2	-1	2	6	1	**83**
7. Iwilei-Māpunapuna-Airport	0	3	8	11	-2	3	3	1	-5	6	3	-2	1	0	2	0	-1	-2	1	10	-1	-2	2	1	-4	**36**
8. Hickam-Pearl Harbor	3	2	0	3	-3	-2	4	8	16	1	-1	1	1	6	2	2	0	0	3	-1	-1	0	1	-2	3	**46**
9. Moanalua-Hālawa	-3	-3	-5	-1	-3	1	1	21	31	3	-2	3	0	-1	3	1	0	-1	6	4	0	1	0	-4	8	**60**
10. 'Aiea-Pearl City	24	1	12	12	12	2	15	24	9	62	1	5	3	17	-2	6	1	0	11	14	7	0	0	7	21	**264**
11. Honouliuli - 'Ewa Beach	38	12	18	66	13	5	16	19	14	25	39	115	4	21	3	4	2	2	5	25	8	0	6	7	46	**513**
12. Kapolei-Ko 'Olina - Kalaeloa	27	12	11	38	18	9	5	21	6	18	24	174	15	20	2	3	6	0	0	19	8	2	21	2	16	**477**
13. Makakilo - Makaiwa	6	2	4	22	3	-2	-3	4	-3	9	5	19	5	9	0	2	1	2	5	7	6	1	0	7	6	**117**
14. Waipahu - Waikele - Kunia	28	5	17	43	2	0	9	12	5	18	8	-4	4	26	8	1	7	1	3	11	8	4	3	4	25	**248**
15. Waiawa-Koa Ridge	47	11	22	91	2	5	15	23	14	31	9	7	-2	27	29	42	23	5	4	5	5	-1	3	0	19	**436**
16. Mililani - Meleman-Kīpapa	6	5	2	0	10	-4	1	11	4	18	-2	11	-2	10	20	17	13	-2	1	16	2	1	1	0	3	**142**
17. Wahiawā-Whitmore-Schofield	-2	-1	2	2	-2	0	1	6	6	6	-1	3	1	2	4	-1	6	1	-1	0	6	3	-1	-1	-2	**37**
18. East Honolulu	7	-3	19	-8	16	2	-11	8	2	-2	2	1	-1	4	1	-2	1	13	-4	0	3	0	-2	6	-7	**45**
19. Kāne'ohe - Kahalu'u - Kualoa	-18	-9	4	-1	0	3	-1	13	-3	9	1	3	-1	9	2	3	1	-4	33	35	-7	-1	-2	1	-14	**56**
20. Kailua - Mokapu-Waimānalo	3	-9	4	2	-5	10	1	-1	4	4	2	-1	0	-2	1	5	1	2	7	63	0	1	1	2	3	**98**
21. Ko'olauloa	4	3	3	3	-1	0	3	1	-2	2	-4	4	0	4	1	-1	2	1	0	4	9	0	2	1	4	**43**
22. North Shore	4	4	0	5	-1	-2	0	1	6	-2	0	1	1	1	0	3	5	0	-2	6	0	1	0	0	5	**36**
23. Wai'anae Coast	-8	-3	-1	-2	8	2	-7	7	4	-5	2	2	3	1	4	3	3	-1	4	4	0	1	9	1	-14	**17**
24. Mānoa - Tantalus	18	11	13	9	9	6	6	3	-5	4	1	0	2	2	-1	2	-2	2	3	6	0	2	-4	11	18	**116**
25. University	2	4	3	-2	5	0	1	-1	2	1	2	1	0	-1	1	0	0	1	0	-1	0	0	0	0	0	**18**
Total	**249**	**99**	**215**	**297**	**141**	**57**	**74**	**205**	**68**	**232**	**92**	**353**	**26**	**187**	**95**	**81**	**68**	**33**	**110**	**258**	**49**	**10**	**39**	**104**	**116**	**3,258**

AR00066754

Table 4-8. Difference between Managed Lane Alternative Reversible Option and No Build Alternative A.M. Peak-period Transit Trips between Origin-Destination Pair

Origin	Destination																									Total
	1. Ward-Chinatown	2. Kaka 'ako	3. Punchbowl-Sheridan-Date	4. Waikīkī	5. Kāhala- Tantalus	6. Pauoa-Kalihi	7. Iwilei-Māpunapuna-Airport	8. Hickam-Pearl Harbor	9. Moanalua-Hālawa	10. ʻAiea-Pearl City	11. Honouliuli - ʻEwa Beach	12. Kapolei-Ko ʻOlina - Kalaeloa	13. Makakilo - Makaiwa	14. Waipahu - Waikele - Kunia	15. Waiawa-Koa Ridge	16. Mililani - Meleman-Kīpapa	17. Wahiawā-Whitmore-Schofield	18. East Honolulu	19. Kāneʻohe - Kahaluʻu - Kualoa	20. Kailua - Mokapu-Waimānalo	21. Koʻolauloa	22. North Shore	23. Waiʻanae Coast	24. Mānoa - Tantalus	25. University	
1. Ward-Chinatown	-4	5	11	-6	2	10	-1	-5	-10	6	-1	4	-1	-2	7	-1	0	5	3	4	-2	0	1	15	-13	**27**
2. Kaka 'ako	3	2	8	5	9	-7	1	-4	1	1	-1	1	-1	-1	2	-2	1	0	6	4	-3	-1	2	14	-3	**37**
3. Punchbowl-Sheridan-Date	10	12	35	1	2	-1	5	7	-5	-6	8	-2	-1	3	0	-1	1	1	6	13	-3	1	-5	7	-10	**78**
4. Waikīkī	-1	-8	-1	-9	-2	-3	1	-2	-1	1	2	5	-2	7	7	-2	-2	-3	-1	13	3	0	-3	1	9	**9**
5. Kāhala- Tantalus	17	-4	18	-2	5	-1	-5	6	-2	1	6	1	1	3	-1	-1	-4	3	-3	4	3	-1	2	16	-6	**56**
6. Pauoa-Kalihi	18	9	6	8	-9	11	-5	10	-11	6	2	-1	1	4	4	-5	1	2	7	11	-3	-2	-1	13	-2	**74**
7. Iwilei-Māpunapuna-Airport	4	3	3	10	-2	0	3	4	-9	6	3	0	0	-1	0	-2	1	-4	-2	11	0	-1	4	2	-6	**27**
8. Hickam-Pearl Harbor	2	-3	2	2	-6	1	5	-7	14	4	-2	0	2	4	3	0	-2	2	3	-1	0	0	-1	-4	7	**25**
9. Moanalua-Hālawa	-4	0	-4	-1	-4	1	0	15	24	7	1	-5	2	1	-1	5	-1	0	3	1	5	0	-3	1	5	**48**
10. ʻAiea-Pearl City	26	4	8	3	8	-6	15	13	0	67	-1	7	2	22	-1	2	3	7	10	14	3	2	-1	7	13	**227**
11. Honouliuli - ʻEwa Beach	31	16	6	61	9	2	7	11	12	25	38	113	5	19	1	2	2	0	6	23	6	0	8	10	40	**453**
12. Kapolei-Ko ʻOlina - Kalaeloa	27	5	15	36	9	8	0	11	-5	21	31	163	17	14	5	-1	6	0	4	17	4	2	20	0	12	**421**
13. Makakilo - Makaiwa	1	1	3	18	7	-1	-7	1	-4	9	5	17	7	7	1	4	0	1	4	6	6	2	-1	6	3	**96**
14. Waipahu - Waikele - Kunia	18	5	11	32	3	-2	10	4	12	8	-3	10	2	25	9	-3	7	3	4	6	7	7	1	2	20	**198**
15. Waiawa-Koa Ridge	39	6	17	73	4	7	15	14	11	29	5	9	0	28	33	49	21	1	3	6	5	3	1	-2	18	**395**
16. Mililani - Meleman-Kīpapa	3	-2	-2	3	3	-4	-1	6	1	13	-3	14	-2	10	21	19	15	-3	0	16	2	0	0	-6	5	**108**
17. Wahiawā-Whitmore-Schofield	-3	-3	7	-3	0	-2	5	0	-2	8	-1	3	1	-3	5	4	9	2	0	0	5	4	-2	-3	-10	**21**
18. East Honolulu	10	-14	19	-8	12	-5	-1	2	-1	0	1	5	0	0	5	-3	1	14	-6	5	0	0	-5	8	-4	**35**
19. Kāneʻohe - Kahaluʻu - Kualoa	-17	-2	0	-4	4	2	-3	5	-1	12	1	0	-2	4	4	0	4	-4	26	39	-5	-1	1	2	-12	**53**
20. Kailua - Mokapu-Waimānalo	4	-5	1	4	-12	1	5	0	-4	9	-1	0	-1	3	0	2	2	3	3	72	-1	-1	0	1	8	**93**
21. Koʻolauloa	-1	4	3	2	0	1	4	-2	0	1	-2	2	0	3	0	1	1	1	-1	5	8	1	1	1	2	**35**
22. North Shore	-1	2	-3	1	4	-1	7	-4	2	2	-2	0	0	-1	2	2	6	1	-2	6	1	7	-1	1	-1	**28**
23. Waiʻanae Coast	-20	-1	-7	-7	-6	1	-11	-4	-7	1	-2	8	0	1	2	1	2	2	1	0	2	2	11	-1	-20	**-52**
24. Mānoa - Tantalus	18	8	7	9	9	10	7	2	-5	4	1	-1	0	1	2	2	-3	2	4	6	1	0	-1	6	24	**113**
25. University	1	1	2	-3	5	3	1	0	4	0	1	0	0	-2	2	-1	0	0	0	-1	1	1	0	0	1	**16**
Total	**181**	**41**	**165**	**225**	**54**	**25**	**57**	**83**	**14**	**235**	**86**	**353**	**30**	**149**	**112**	**71**	**71**	**36**	**78**	**280**	**45**	**25**	**28**	**97**	**80**	**2,621**

Table 4-9. Difference between Fixed Guideway Kalaeloa – Salt Lake – North King – Hotel Combination and No Build Alternative A.M. Peak-period Transit Trips between Origin-Destination Pairs

Origin	Destination																									Total
	1. Ward-Chinatown	2. Kaka 'ako	3. Punchbowl-Sheridan-Date	4. Waikīkī	5. Kāhala- Tantalus	6. Pauoa-Kalihi	7. Iwilei-Māpunapuna-Airport	8. Hickam-Pearl Harbor	9. Moanalua-Hālawa	10. 'Aiea-Pearl City	11. Honouliuli - 'Ewa Beach	12. Kapolei-Ko 'Olina – Kalaeloa	13. Makakilo - Makaiwa	14. Waipahu - Waikele - Kunia	15. Waiawa-Koa Ridge	16. Mililani - Meleman-Kīpapa	17. Wahiawā-Whitmore-Schofield	18. East Honolulu	19. Kāne'ohe - Kahalu'u - Kualoa	20. Kailua - Mokapu-Waimānalo	21. Ko'olauloa	22. North Shore	23. Wai'anae Coast	24. Mānoa - Tantalus	25. University	
1. Ward-Chinatown	-5	10	34	9	22	3	5	-7	13	25	6	11	3	11	10	-6	-3	3	15	1	-5	-1	-1	18	10	**181**
2. Kaka 'ako	31	-3	25	-1	8	4	20	1	16	10	-3	6	0	5	5	-3	4	2	5	3	-2	2	2	17	19	**173**
3. Punchbowl-Sheridan-Date	86	44	44	4	-9	9	15	2	28	13	10	10	-2	16	0	-8	2	0	9	6	0	-3	-2	6	23	**303**
4. Waikīkī	63	-10	-14	-63	1	1	14	9	12	11	7	15	-3	19	4	-1	-1	-2	1	10	0	4	-1	-5	16	**87**
5. Kāhala- Tantalus	74	18	13	7	4	13	10	9	14	7	4	4	2	8	3	-3	-2	9	-5	-4	6	0	0	14	-3	**202**
6. Pauoa-Kalihi	7	26	14	9	14	19	-14	4	14	22	4	0	2	17	0	-2	2	1	13	10	-4	-2	-1	12	31	**198**
7. Iwilei-Māpunapuna-Airport	21	18	18	17	9	-9	-3	-20	30	15	5	7	3	8	1	1	-2	1	5	0	2	0	-1	4	16	**146**
8. Hickam-Pearl Harbor	11	1	1	2	-2	-1	-1	-10	24	4	3	2	2	11	6	0	0	1	0	1	-1	0	2	0	13	**69**
9. Moanalua-Hālawa	134	47	40	36	18	32	89	77	138	100	12	23	1	45	9	10	7	4	7	18	3	3	3	8	56	**920**
10. 'Aiea-Pearl City	207	61	70	59	34	52	143	118	257	193	29	70	9	128	20	21	16	5	22	32	2	3	-5	20	111	**1,677**
11. Honouliuli - 'Ewa Beach	185	72	96	220	61	41	91	89	141	137	211	454	26	159	16	23	25	13	14	47	20	6	39	29	242	**2,457**
12. Kapolei-Ko 'Olina - Kalaeloa	139	59	77	193	53	33	74	90	111	127	145	626	43	139	23	22	29	12	11	38	19	3	102	22	166	**2,356**
13. Makakilo - Makaiwa	24	10	12	33	12	4	10	15	21	26	11	44	3	31	3	5	1	1	4	4	-1	4	4	3	39	**323**
14. Waipahu - Waikele - Kunia	103	18	72	143	20	17	49	40	64	79	22	62	9	96	27	15	22	4	10	9	1	7	2	11	99	**1,001**
15. Waiawa-Koa Ridge	80	20	54	135	15	18	30	32	65	45	13	59	2	85	3	54	23	5	9	9	3	2	3	3	56	**823**
16. Mililani - Meleman-Kīpapa	62	19	22	25	21	6	21	19	51	36	11	57	0	49	8	41	22	6	4	17	4	9	0	-2	75	**583**
17. Wahiawā-Whitmore-Schofield	16	4	14	6	2	1	6	4	19	13	6	16	3	10	4	15	16	1	0	4	4	3	1	5	34	**207**
18. East Honolulu	-5	3	20	3	11	0	-2	-10	11	6	4	4	-1	9	2	-3	-1	9	-8	8	2	0	-3	1	1	**61**
19. Kāne'ohe - Kahalu'u - Kualoa	-13	-3	3	9	-5	2	-9	-3	7	13	4	8	-2	16	2	3	-3	-4	24	37	-7	-2	0	5	17	**99**
20. Kailua - Mokapu-Waimānalo	5	-1	9	6	-5	3	5	-1	15	10	-2	7	-1	9	0	1	5	2	4	77	-3	2	0	4	28	**179**
21. Ko'olauloa	1	3	3	5	-2	1	2	-3	2	1	-3	5	0	4	1	2	1	0	1	5	7	3	0	-1	15	**53**
22. North Shore	16	10	12	12	6	4	11	-2	12	4	0	10	0	11	1	3	7	2	-5	10	1	8	-2	-4	32	**159**
23. Wai'anae Coast	21	12	3	12	9	4	1	9	36	4	2	24	-2	26	7	6	4	10	3	-1	1	2	23	0	60	**276**
24. Mānoa - Tantalus	15	27	22	12	6	2	6	0	11	9	4	-1	0	5	2	0	-2	2	4	4	0	0	-2	15	17	**158**
25. University	11	4	11	3	3	5	5	-1	8	3	6	5	2	0	4	0	1	0	-2	1	1	3	2	-2	1	**74**
Total	**1,289**	**469**	**675**	**896**	**306**	**264**	**578**	**461**	**1,120**	**913**	**511**	**1,528**	**99**	**917**	**161**	**196**	**173**	**87**	**145**	**346**	**53**	**56**	**165**	**183**	**1,174**	**12,765**

Table 4-10. Difference between Fixed Guideway Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination and No Build Alternative A.M. Peak-period Transit Trips between Origin-Destination Pairs

Origin	Destination																									Total
	1. Ward-Chinatown	2. Kaka 'ako	3. Punchbowl-Sheridan-Date	4. Waikīkī	5. Kāhala- Tantalus	6. Pauoa-Kalihi	7. Iwilei-Māpunapuna-Airport	8. Hickam-Pearl Harbor	9. Moanalua-Hālawa	10. 'Aiea-Pearl City	11. Honouliuli - 'Ewa Beach	12. Kapolei-Ko 'Olina - Kalaeloa	13. Makakilo - Makaiwa	14. Waipahu - Waikele - Kunia	15. Waiawa-Koa Ridge	16. Mililani - Meleman-Kīpapa	17. Wahiawā-Whitmore-Schofield	18. East Honolulu	19. Kāne'ohe - Kahalu'u - Kualoa	20. Kailua - Mokapu-Waimānalo	21. Ko'olauloa	22. North Shore	23. Wai'anae Coast	24. Mānoa - Tantalus	25. University	
1. Ward-Chinatown	-21	15	28	19	1	0	11	18	9	19	1	7	3	6	8	-1	0	5	9	-3	-1	2	-1	24	7	**165**
2. Kaka 'ako	15	-10	12	13	3	-4	19	25	13	4	0	3	1	3	3	-1	1	1	2	2	3	1	1	22	16	**148**
3. Punchbowl-Sheridan-Date	71	33	24	12	-21	3	39	36	17	14	8	6	-2	5	-1	0	5	-4	7	4	1	2	-5	10	6	**270**
4. Waikīkī	73	10	31	-76	-18	2	28	43	8	12	10	11	-2	14	6	2	-1	-5	4	7	2	1	-1	7	8	**176**
5. Kāhala- Tantalus	48	14	3	-15	-4	9	16	18	8	14	4	7	0	5	1	-2	-2	4	-1	3	2	-1	0	7	-6	**132**
6. Pauoa-Kalihi	4	16	16	14	5	25	-3	54	-4	14	3	4	0	15	-2	-3	2	-4	13	10	-2	-3	1	4	27	**206**
7. Iwilei-Māpunapuna-Airport	21	20	18	24	12	-2	-14	18	14	23	8	0	-1	8	2	-1	1	1	3	4	-1	1	3	6	24	**192**
8. Hickam-Pearl Harbor	41	9	17	22	0	11	26	34	35	30	3	12	1	26	10	2	2	0	4	7	-2	1	3	2	16	**312**
9. Moanalua-Hālawa	70	27	25	24	8	13	59	112	69	53	6	19	4	35	5	8	3	2	5	9	4	2	-3	9	35	**603**
10. 'Aiea-Pearl City	210	58	64	67	38	40	154	239	215	179	22	76	9	127	20	28	13	10	19	29	5	1	-2	11	92	**1,724**
11. Honouliuli - 'Ewa Beach	94	35	44	127	28	26	53	88	79	83	81	231	13	83	9	12	10	6	8	21	9	1	22	16	174	**1,353**
12. Kapolei-Ko 'Olina - Kalaeloa	134	51	78	208	47	37	66	136	86	130	120	508	45	139	21	21	28	7	9	35	17	3	99	20	144	**2,189**
13. Makakilo - Makaiwa	16	7	12	33	9	1	9	27	14	25	8	36	4	32	1	3	3	0	3	3	4	3	4	3	34	**294**
14. Waipahu - Waikele - Kunia	92	19	67	164	15	18	47	79	41	81	15	67	7	90	26	12	14	1	6	10	5	5	3	7	88	**979**
15. Waiawa-Koa Ridge	70	15	51	152	13	20	33	66	44	54	19	51	6	79	1	47	22	1	7	9	2	1	7	3	56	**829**
16. Mililani - Meleman-Kīpapa	49	20	20	29	15	9	27	58	34	38	5	67	-3	50	8	36	18	0	3	14	4	4	4	1	70	**580**
17. Wahiawā-Whitmore-Schofield	16	2	15	4	8	-2	8	15	11	15	5	20	1	12	4	6	23	1	-2	7	2	6	0	3	23	**203**
18. East Honolulu	-8	1	13	2	10	-4	3	5	7	1	2	6	0	7	3	-4	-3	13	-6	5	1	1	-3	1	-12	**41**
19. Kāne'ohe - Kahalu'u - Kualoa	-21	-2	-9	-1	-6	5	-5	18	-4	19	-1	12	-1	13	-2	1	2	-3	24	34	-9	-2	-1	3	-18	**46**
20. Kailua - Mokapu-Waimānalo	-1	-2	-4	4	-16	2	-5	19	1	2	5	-4	-2	8	-4	4	1	-1	4	77	3	0	0	-5	3	**89**
21. Ko'olauloa	1	1	-1	-1	-2	1	1	3	-1	1	-4	5	1	4	-1	1	1	1	1	5	8	0	-1	-1	5	**28**
22. North Shore	7	8	9	10	6	0	14	12	9	0	-1	10	0	14	-2	4	5	-1	-3	9	-1	7	-4	-2	32	**142**
23. Wai'anae Coast	22	6	17	27	5	6	8	60	30	21	9	11	2	16	9	5	5	6	1	1	0	2	25	-1	58	**351**
24. Mānoa - Tantalus	14	12	24	22	3	4	19	19	5	4	0	0	1	6	3	1	-1	7	3	4	1	1	-4	12	20	**180**
25. University	8	3	8	-2	5	3	4	2	6	2	2	5	0	2	2	1	0	2	2	-2	0	2	1	-2	2	**56**
Total	**1,025**	**368**	**582**	**882**	**164**	**223**	**617**	**1,204**	**746**	**838**	**330**	**1,170**	**87**	**799**	**130**	**182**	**152**	**50**	**125**	**304**	**57**	**41**	**148**	**160**	**904**	**11,288**

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Table 4-11. Difference between Fixed Guideway Kalaeloa – Airport – Dillingham – Halekauwila Combination and No Build Alternative A.M. Peak-period Transit Trips between Origin-Destination Pairs

Origin	Destination																									Total
	1. Ward-Chinatown	2. Kaka 'ako	3. Punchbowl-Sheridan-Date	4. Waikīkī	5. Kāhala- Tantalus	6. Pauoa-Kalihi	7. Iwilei-Māpunapuna-Airport	8. Hickam-Pearl Harbor	9. Moanalua-Hālawa	10. ‘Aiea-Pearl City	11. Honouliuli - ‘Ewa Beach	12. Kapolei-Ko ‘Olina - Kalaeloa	13. Makakilo - Makaiwa	14. Waipahu - Waikele - Kunia	15. Waiawa-Koa Ridge	16. Mililani - Meleman-Kīpapa	17. Wahiawā-Whitmore-Schofield	18. East Honolulu	19. Kāne‘ohe - Kahalu‘u - Kualoa	20. Kailua - Mokapu-Waimānalo	21. Ko‘olauloa	22. North Shore	23. Wai‘anae Coast	24. Mānoa - Tantalus	25. University	
1. Ward-Chinatown	-7	17	18	0	8	7	9	8	13	14	2	4	3	8	6	5	0	7	9	3	-2	-3	0	9	19	**157**
2. Kaka 'ako	22	-15	26	1	5	1	26	19	17	10	3	2	-1	6	4	-6	4	6	4	5	0	0	3	25	14	**181**
3. Punchbowl-Sheridan-Date	47	56	43	3	-12	9	30	29	23	10	8	8	-1	10	1	0	2	-7	5	10	-1	0	-2	16	13	**300**
4. Waikīkī	8	-4	-4	-14	-3	2	18	24	5	16	6	13	-4	8	4	1	4	1	2	11	3	0	1	0	6	**104**
5. Kāhala- Tantalus	36	22	9	15	7	9	25	20	9	16	1	5	2	5	1	0	-2	13	-3	-3	3	-1	0	17	-2	**204**
6. Pauoa-Kalihi	17	17	15	6	13	24	-3	49	0	20	7	1	2	10	-1	-1	2	4	5	11	0	0	-2	-2	30	**224**
7. Iwilei-Māpunapuna-Airport	25	27	25	23	16	0	-15	23	21	19	9	2	1	6	0	2	2	-3	1	8	0	0	1	4	19	**216**
8. Hickam-Pearl Harbor	35	15	15	22	4	12	22	34	40	25	8	11	2	25	10	4	2	0	5	2	0	3	1	-2	17	**312**
9. Moanalua-Hālawa	56	32	23	24	4	21	58	119	69	60	6	16	2	32	5	8	4	0	5	3	2	3	4	9	43	**608**
10. ‘Aiea-Pearl City	187	65	63	56	41	43	161	235	220	191	23	73	7	131	15	30	15	3	14	29	8	1	1	19	101	**1,732**
11. Honouliuli - ‘Ewa Beach	158	68	81	213	57	47	91	148	117	135	205	427	28	156	18	26	19	10	14	36	16	3	43	28	229	**2,373**
12. Kapolei-Ko ‘Olina - Kalaeloa	131	56	77	197	49	37	70	149	83	130	147	600	41	138	17	27	25	11	10	34	14	3	103	12	172	**2,333**
13. Makakilo - Makaiwa	20	10	14	33	9	0	10	31	18	23	16	39	5	31	4	5	2	2	5	5	-2	3	5	6	42	**336**
14. Waipahu - Waikele - Kunia	87	22	67	142	13	14	45	77	52	84	18	64	8	99	26	12	23	10	6	11	3	7	-1	9	96	**994**
15. Waiawa-Koa Ridge	69	19	53	137	15	15	31	60	55	48	17	49	4	83	6	54	21	2	9	9	2	3	4	-1	62	**826**
16. Mililani - Meleman-Kīpapa	39	21	17	27	18	8	23	55	42	39	9	54	-2	53	7	41	23	-1	1	19	5	7	5	5	75	**590**
17. Wahiawā-Whitmore-Schofield	9	0	17	4	10	-2	13	15	14	12	6	15	2	14	-1	12	19	2	-2	6	3	6	1	-2	30	**203**
18. East Honolulu	-19	11	21	4	10	-2	2	12	4	-2	4	5	-1	9	2	-3	1	13	-9	3	1	-1	-2	4	4	**71**
19. Kāne‘ohe - Kahalu‘u - Kualoa	-26	-4	-5	-4	-10	3	-4	24	-6	8	0	11	-1	17	1	1	2	-3	22	34	-7	-2	-1	6	-14	**42**
20. Kailua - Mokapu-Waimānalo	4	-3	-2	-4	-16	-1	-2	11	1	10	1	2	0	-1	-1	2	4	0	1	83	4	-1	0	1	0	**93**
21. Ko‘olauloa	1	2	-1	-2	-1	-1	1	2	0	1	-1	2	0	5	-1	0	2	1	0	5	7	0	0	1	3	**26**
22. North Shore	8	9	9	8	10	4	9	11	8	1	1	8	0	10	1	2	6	0	-4	7	-1	13	-3	-2	28	**143**
23. Wai‘anae Coast	4	10	7	13	4	4	-1	54	31	7	8	21	0	23	4	9	0	2	2	1	-2	3	27	6	51	**288**
24. Mānoa - Tantalus	19	12	23	15	9	0	23	19	4	16	3	2	0	3	1	-1	-1	0	-2	8	-1	4	-4	19	27	**198**
25. University	6	10	9	4	5	1	4	2	4	4	6	7	0	0	2	1	1	-1	0	-1	1	1	1	1	0	**68**
Total	**936**	**475**	**620**	**923**	**265**	**255**	**646**	**1,230**	**844**	**897**	**513**	**1,441**	**97**	**881**	**131**	**231**	**180**	**72**	**100**	**339**	**56**	**52**	**185**	**188**	**1,065**	**12,622**

Table 4-12. Difference between Fixed Guideway (20-mile Alignment) and No Build Alternative A.M. Peak-period Transit Trips between Origin-Destination Pairs

Origin	Destination																									Total
	1. Ward-Chinatown	2. Kaka 'ako	3. Punchbowl-Sheridan-Date	4. Waikīkī	5. Kāhala- Tantalus	6. Pauoa-Kalihi	7. Iwilei-Māpunapuna-Airport	8. Hickam-Pearl Harbor	9. Moanalua-Hālawa	10. ‘Aiea-Pearl City	11. Honouliuli - ‘Ewa Beach	12. Kapolei-Ko ‘Olina - Kalaeloa	13. Makakilo - Makaiwa	14. Waipahu - Waikele - Kunia	15. Waiawa-Koa Ridge	16. Mililani - Meleman-Kīpapa	17. Wahiawā-Whitmore-Schofield	18. East Honolulu	19. Kāne‘ohe - Kahalu‘u - Kualoa	20. Kailua - Mokapu-Waimānalo	21. Ko‘olauloa	22. North Shore	23. Wai‘anae Coast	24. Mānoa - Tantalus	25. University	
1. Ward-Chinatown	-11	11	19	-1	1	5	15	10	-2	20	6	-1	1	11	8	-3	-1	5	9	2	-1	0	-1	21	-17	**106**
2. Kaka 'ako	17	-33	15	-2	13	4	24	21	18	13	-3	7	-2	5	2	1	2	0	2	3	1	0	1	22	-6	**125**
3. Punchbowl-Sheridan-Date	16	20	32	5	0	-1	17	29	4	7	6	5	1	15	-2	1	0	-2	5	6	-1	-2	-6	8	-10	**153**
4. Waikīkī	-6	-16	3	1	-10	-8	3	32	9	9	5	9	-3	14	5	1	1	-3	1	11	2	2	-1	6	3	**70**
5. Kāhala- Tantalus	21	-4	22	5	13	-4	5	11	7	-1	3	1	0	8	1	2	-2	6	-1	2	4	-1	3	17	-3	**115**
6. Pauoa-Kalihi	17	22	12	3	10	19	0	49	9	21	9	-1	1	14	2	-3	-2	-4	4	14	-1	-3	2	6	-5	**195**
7. Iwilei-Māpunapuna-Airport	23	26	19	24	7	6	-16	21	23	20	4	3	2	6	2	1	2	0	4	7	-1	-1	2	3	-2	**185**
8. Hickam-Pearl Harbor	35	13	13	22	5	9	26	34	41	25	12	4	1	24	10	4	2	-1	2	8	0	0	3	2	10	**304**
9. Moanalua-Hālawa	57	27	20	30	4	21	65	117	68	58	10	11	2	33	7	7	2	-1	2	7	3	4	0	4	23	**581**
10. ‘Aiea-Pearl City	188	62	62	60	44	39	163	234	210	192	21	57	8	136	16	27	16	2	25	25	3	2	-5	12	65	**1,664**
11. Honouliuli - ‘Ewa Beach	147	67	77	206	51	38	89	141	109	125	180	322	18	154	13	20	18	5	15	35	22	3	23	36	172	**2,086**
12. Kapolei-Ko ‘Olina - Kalaeloa	55	30	38	96	17	15	36	83	45	65	92	233	17	81	9	13	16	1	7	18	8	0	19	6	71	**1,071**
13. Makakilo - Makaiwa	13	9	7	27	8	-4	7	30	12	20	8	20	5	25	2	2	4	0	4	3	0	3	-2	10	14	**227**
14. Waipahu - Waikele - Kunia	81	26	62	156	19	13	49	74	55	80	13	45	7	101	28	16	18	2	9	9	2	6	2	11	65	**949**
15. Waiawa-Koa Ridge	68	20	47	143	10	15	36	64	48	48	16	44	0	87	6	53	22	4	7	7	4	2	4	2	40	**797**
16. Mililani - Meleman-Kīpapa	38	20	18	23	24	8	25	54	37	40	5	51	-3	52	13	44	22	-3	3	13	7	4	4	2	38	**539**
17. Wahiawā-Whitmore-Schofield	14	4	8	8	3	3	7	16	20	11	7	10	3	12	3	11	21	1	0	2	5	4	0	-2	12	**183**
18. East Honolulu	4	-5	15	-7	1	-6	-7	15	-1	0	3	2	-1	3	2	-3	-3	14	-6	10	-2	-1	-1	11	0	**37**
19. Kāne‘ohe - Kahalu‘u - Kualoa	-21	-7	-8	-11	6	4	-6	20	1	14	0	8	-2	21	-1	1	0	-2	17	38	-5	-2	-1	-1	-12	**51**
20. Kailua - Mokapu-Waimānalo	2	-1	-4	-2	-15	0	0	10	6	6	-1	-2	1	6	0	1	3	1	4	80	2	0	-1	2	2	**100**
21. Ko‘olauloa	0	2	1	-1	-1	-1	3	-2	5	0	-1	1	1	4	0	-1	2	1	0	5	8	0	1	1	2	**30**
22. North Shore	6	11	5	10	6	6	6	11	10	2	1	7	0	9	1	3	4	0	-2	7	-3	12	-2	1	17	**128**
23. Wai‘anae Coast	5	6	4	16	4	4	2	49	30	8	0	14	5	20	5	8	2	4	0	2	0	3	25	0	17	**233**
24. Mānoa - Tantalus	22	12	13	17	9	-1	17	32	-4	7	6	-1	2	5	0	0	-1	-2	6	1	1	0	-3	13	26	**177**
25. University	1	2	1	-1	4	-5	2	0	3	4	3	2	0	-2	2	0	2	-1	1	-1	0	1	1	3	2	**24**
Total	**792**	**324**	**501**	**827**	**233**	**179**	**568**	**1,155**	**763**	**794**	**405**	**851**	**64**	**844**	**134**	**206**	**150**	**27**	**118**	**314**	**58**	**36**	**67**	**196**	**524**	**10,130**

The greatest impact of the transit system on the overall transportation network is during the peak commuter travel periods when the roadways are most congested. It is during this period that attracting more travelers to transit would pay the largest dividends in terms of increased system mobility. In comparison to the non-fixed guideway alternatives, the Fixed Guideway Alternative combinations show the largest increase in total a.m. peak-period transit trips over the No Build Alternative by a significant margin (Table 4-4). The three Full-corridor Alignment combinations show increases ranging from 11,310 to 12,760 transit trips, which are 30 to 34 percent increases. The 20-mile Alignment is also expected to attract a significant number of a.m. peak-period trips (10,140) over the No Build Alternative, representing a 27 percent increase.

Table 4-13 shows projected daily fixed guideway boardings by station for each of the Fixed Guideway alignment options, as well as the 20-mile Alignment. Stations expected to experience a relatively high level of boardings include the terminus stations, those stations with major park-and-ride facilities, and those stations with major bus interface activity. Of the three full-corridor alignments, all have comparable projected boardings in the Kapolei, ‘Ewa, Waipahu, Pearl City, and ‘Aiea areas. The Kalaeloa - Airport - Dillingham - Halekauwila alignment is projected to have higher ridership through the Salt Lake, Airport, and Kalihi areas; while the Kalaeloa - Salt Lake - North King - Hotel alignment is expected to have the highest ridership through the Downtown and Kaka‘ako areas. The latter result is due primarily to the Hotel Street alignment being more central to many Downtown destinations in comparison to the Nimitz - Halekauwila alignment, as well as its having more proposed stations through Downtown.

Table 4-14 through Table 4-17 show year 2030 a.m. peak-hour transit boardings by station by mode of arrival and departure for each of the three Fixed Guideway alignment combinations as well as the 20-mile Alignment. For all of the Fixed Guideway options, the primary mode of access to the stations overall was via bus, indicating the integration with and reliance on bus connections to the fixed guideway line to serve the greater study corridor area. Regarding mode of departure, the primary mode used for each of the three Full-corridor Alignments was walking. However, for the 20-mile Alignment, a higher number of trips are projected to egress the stations by bus. This reflects the fact that the 20-mile Alignment would rely more heavily on its integration with the bus system, particularly at its termini stations.

Table 4-13. Year 2030 Fixed Guideway Daily Boardings[1]

Station	Combination Alignment: Kalaeloa – Salt Lake – North King – Hotel	Combination Alignment: Kamokila – Airport – Dillingham – King with a Waikīkī Branch	Combination Alignment: Kalaeloa – Airport – Dillingham – Halekauwila	20-mile Alignment East Kapolei to Ala Moana Center
Kapolei Parkway & Hanua Street	6,740	6,670	6,730	N/A[2]
Kamokila Blvd. & Wākea Street	N/A	4,410	N/A	N/A
Kapolei Pkwy & Wākea Street	3,530	N/A	3,210	N/A
Saratoga Avenue & Wākea Street	640	N/A	630	N/A
Farrington Hwy at UH West O'ahu	N/A	5,660	N/A	N/A
Saratoga Avenue & Fort Barrette Road	640	N/A	620	N/A
Kapolei Pkwy & North-South Road	4,510	N/A	5,430	5,860
North-South Road between Kapolei Parkway & Farrington Highway	1,580	N/A	1,730	N/A
Farrington Hwy & North-South Road	8,390	1,550	5,540	7,650
Farrington Hwy between North-South Road & Fort Weaver Road	1,110	3,350	1,750	3,610
Farrington Highway & Leokū Street	4,070	3,460	4,550	4,970
Farrington Hwy & Mokuola Street	2,990	3,610	2,990	2,710
Leeward Community College	1,530	1,380	1,490	1,500
Kamehameha Hwy & Kuala Street	9,600	9,800	9,540	9,200
Kamehameha Highway & Kaonohi Street	7,390	6,610	6,880	6,140
Aloha Stadium	N/A	4,340	4,390	4,400
Salt Lake Boulevard & Kahuapa'ani Street	9,230	N/A	N/A	N/A
Salt Lake Blvd. & Ala Inoi Place	4,540	N/A	N/A	N/A
Kamehameha Hwy & Radford Drive	N/A	5,230	5,800	5,330
Honolulu International Airport	N/A	3,710	3,870	3,830
Aolele Street & Lagoon Drive	N/A	3,420	3,010	1,990
Middle Street Transit Center	N/A	3,360	3,180	3,630
N. King Street & Owen Street	3,530	N/A	N/A	N/A
N. King Street & Waiakamilo Road	2,580	N/A	N/A	N/A
N. King Street at Liliha Street	4,750	N/A	N/A	N/A
Dillingham Blvd. & Mokauea Street	N/A	2,980	3,030	2,720
Dillingham Blvd. & Kōkea Street	N/A	2,540	2,340	1,970
Ka'aahi Street	N/A	3,480	4,370	3,390
King Street & Bethel Street	N/A	7,350	N/A	N/A
King Street & Punchbowl Street	N/A	6,330	N/A	N/A
Hotel Street & Kekaulike Street	1,000	N/A	N/A	N/A
Hotel Street & Nu'uanu Avenue	3,270	N/A	N/A	N/A
Hotel Street & Fort Street Mall	9,150	N/A	N/A	N/A
Honolulu Hale	2,210	N/A	N/A	N/A
Nimitz Highway & Kekaulike Street	N/A	N/A	2,390	1,650
Nimitz Highway & Fort Street Mall	N/A	N/A	5,800	3,670
Waimanu Street & Cummins Street	N/A	3,190	N/A	N/A
Kawaiaha'o Street & Cooke Street	4,190	N/A	N/A	N/A
Halekauwila Street & South Street	N/A	N/A	3,870	5,700
Halekauwila Street & Ward Avenue	N/A	N/A	2,910	2,240
Ala Moana Center	5,140	5,200	9,780	12,990
Kapi'olani Blvd. & McCully Street	11,360	1,110	4,450	N/A
University Avenue & Date Street	3,580	2,460	3,010	N/A
University Avenue & S. King Street	4,280	3,240	4,200	N/A
UH Lower Campus	6,930	5,490	6,180	N/A

Station	Combination Alignment			20-mile Alignment East Kapolei to Ala Moana Center
	Kalaeloa – Salt Lake – North King – Hotel	Kamokila – Airport – Dillingham – King with a Waikīkī Branch	Kalaeloa – Airport – Dillingham – Halekauwila	
Waikīkī Branch				
Convention Center from Kalākaua Avenue	N/A	2,630	N/A	N/A
Kūhiō Avenue & Kālaimoku Street	N/A	4,220	N/A	N/A
Kūhiō Avenue & Liliʻuokalani Avenue	N/A	5,760	N/A	N/A
Total Daily Boardings[1]	**128,460**	**122,540**	**123,670**	**94,970**

[1]Boardings are a count of individual passengers entering a transit vehicle.
[2]N/A = Not applicable, as this station would not exist for this alternative.

Table 4-14. Year 2030 A.M. Peak Hour Fixed Guideway Station Volumes by Mode of Arrival and Departure (Kalaeloa – Salt Lake – North King – Hotel Combination Alignment)

Station	Mode of Arrival				Mode of Departure		
	Walk	Bus	Drive	Total	Walk	Bus	Total
Kapolei Parkway & Hanua Street	16	811	552	1,379	40	74	114
Kapolei Parkway & Wākea Street	106	184	0	290	36	429	465
Saratoga Avenue & Wākea Street	72	0	0	72	58	0	58
Saratoga Ave & Fort Barrette Road	3	5	0	8	53	50	103
Saratoga Ave & North-South Road	19	184	742	945	32	22	54
North-South Road between Kapolei Parkway & Farrington Highway	42	278	0	320	8	95	103
Farrington Hwy & North-South Road	168	745	758	1,671	217	49	266
Farrington Highway between North-South Road & Fort Weaver Road	66	59	0	125	82	28	110
Farrington Highway & Leokū Street	106	439	0	545	127	235	362
Farrington Highway & Mokuola Street	58	338	0	396	88	142	230
Leeward Community College	32	0	0	32	316	0	316
Kamehameha Hwy & Kuala Street	153	1,366	634	2,153	103	171	274
Kamehameha Hwy & Kaonohi Street	32	637	0	669	177	565	742
Salt Lake Blvd. & Kahuapa'ani Street	48	241	515	804	451	618	1,069
Salt Lake Boulevard & Ala Inoi Place	177	228	0	405	139	446	585
N. King Street & Owen Street	34	237	0	271	185	274	459
N. King Street & Waiakamilo Street	108	16	0	124	321	26	347
N. King Street at Dillingham Boulevard. & Liliha Street	75	124	0	199	330	523	853
Hotel Street & Kekaulike Street	61	0	0	61	121	17	138
Hotel Street & Nuʻuanu Avenue	165	0	0	165	372	0	372
Hotel Street & Fort Street Mall	78	507	0	585	1,257	100	1,357
Honolulu Hale	68	5	0	73	382	16	398
Kawaiahaʻo Street & Cooke Street	328	0	0	328	562	0	562
Ala Moana Center	92	96	0	188	565	267	832
Hawaiʻi Convention Center or Kapiʻolani Blvd & McCully Street	337	498	0	835	466	890	1,356
University Avenue & Date Street	248	191	0	439	131	203	334
University Avenue & S. King Street	129	269	0	398	124	246	370
UH Mānoa	106	59	0	165	1,145	266	1,411
Totals	2,927	7,517	3,201	13,645	7,888	5,752	13,640

Table 4-15. Year 2030 A.M. Peak Hour Fixed Guideway Station Volumes by Mode of Arrival and Departure (Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination Alignment)

Station	Mode of Arrival				Mode of Departure		
	Walk	Bus	Drive	Total	Walk	Bus	Total
Kapolei Parkway & Hanua Street	16	854	551	1421	27	43	70
Kamokila Blvd & Wākea Street	15	633	0	648	149	358	507
Farrington Hwy at UH West Oʻahu	11	308	761	1,080	5	13	18
Farrington Hwy & North-South Road	187	0	0	187	202	1	203
Farrington Highway between North-South Road & Fort Weaver Road	77	559	0	636	65	58	123
Farrington Highway & Leokū Street	110	362	0	472	122	217	339
Farrington Highway & Mokuola Street	116	442	0	558	101	111	212
Leeward Community College	32	0	0	32	300	0	300
Kamehameha Hwy & Kuala Street	158	1,366	635	2,159	99	153	252
Kamehameha Hwy & Kaonohi Street	30	684	0	714	157	473	630
Aloha Stadium	11	105	565	681	62	150	212
Kamehameha Hwy & Radford Drive	30	206	0	236	389	534	923
Honolulu International Airport	95	56	0	151	456	16	472
Aolele Street & Lagoon Drive	37	137	0	174	237	284	521
Middle Street Transit Center	16	339	0	355	96	262	358
Dillingham Blvd. & Mokauea Street	164	25	0	189	309	64	373
Dillingham Boulevard & Kōkea Street	107	0	0	107	354	39	393
Kaʻaahi Street	14	226	0	240	117	358	475
King Street & Bethel Street	289	5	0	294	1,457	74	1,531
King Street & Punchbowl Street	186	38	0	224	547	233	780
Waimanu Street & Cummins Street	208	0	0	208	366	0	366
Kona Street & Keʻeaumoku Street	102	166	0	268	540	247	787
Hawaiʻi Convention Center or Kapiʻolani Boulevard & McCully Street	152	1	0	153	68	0	68
University Avenue & Date Street	162	140	0	302	89	160	249
University Avenue & S. King Street	108	267	0	375	81	163	244
UH Lower Campus	84	42	0	126	966	157	1,123
Waikīkī Branch							
Convention Center from Kalākaua Avenue	223	3	0	226	164	2	166
Kūhiō Avenue & Kālaimoku Street	163	106	0	269	466	0	466
Kūhiō Avenue & Liliʻuokalani Avenue	247	130	0	377	529	170	699
Totals	3,150	7,200	2,512	12,862	8,520	4,340	12,860

Table 4-16. Year 2030 A.M. Peak Hour Fixed Guideway Station Volumes by Mode of Arrival and Departure (Kalaeloa – Airport – Dillingham – Halekauwila Combination Alignment)

Station	Mode of Arrival				Mode of Departure		
	Walk	Bus	Drive	Total	Walk	Bus	Total
Kapolei Parkway & Hanua Street	16	823	536	1,375	35	67	102
Kapolei Parkway & Wākea Street	101	149	0	250	34	385	419
Saratoga Avenue. & Wākea Street	72	0	0	72	56	0	56
Saratoga Avenue & Fort Barrette Road	3	5	0	8	51	50	101
Saratoga Avenue & North-South Road	19	274	892	1,185	33	22	55
North-South Road between Kapolei Parkway & Farrington Highway	43	285	0	328	8	107	115
Farrington Hwy & North-South Road	152	410	545	1,107	133	76	209
Farrington Highway between North-South Road & Fort Weaver Road	62	219	0	281	80	21	101
Farrington Highway & Leokū Street	107	523	0	630	126	241	367
Farrington Highway & Mokuola Street	58	341	0	399	87	142	229
Leeward Community College	32	0	0	32	309	0	309
Kamehameha Hwy & Kuala Street	157	1,345	638	2,140	101	167	268
Kamehameha Hwy & Kaonohi Street	30	671	0	701	157	498	655
Aloha Stadium	12	105	586	703	56	159	215
Kamehameha Hwy & Radford Drive	51	177	0	228	396	547	943
Honolulu International Airport	98	54	0	152	549	50	599
Aolele Street & Lagoon Drive	28	130	0	158	155	274	429
Middle Street Transit Center	16	324	0	340	102	293	395
Dillingham Blvd. & Mokauea Street	154	24	0	178	298	71	369
Dillingham Boulevard & Kōkea Street	86	0	0	86	324	47	371
Ka‘aahi Street	85	216	0	301	148	464	612
Nimitz Highway & Kekaulike Streets	195	0	0	195	272	0	272
Nimitz Highway & Fort Street Mall	79	35	0	114	990	69	1,059
Halekauwila Street & South Street	141	72	0	213	442	221	663
Halekauwila Street & Ward Avenue	217	8	0	225	350	29	379
Kona Street & Ke‘eaumoku Street	107	264	0	371	552	1,058	1,610
Hawai‘i Convention Center or Kapi‘olani Boulevard & McCully Street	449	0	0	449	358	1	359
University Avenue & Date Street	167	180	0	347	102	202	304
University Avenue & South King Street	125	316	0	441	97	221	318
UH Lower Campus	59	81	0	140	986	291	1277
Totals	2,921	7,031	3,197	13,149	7,387	5,773	13,160

Table 4-17. Year 2030 A.M. Peak Hour Fixed Guideway Station Volumes by Mode of Arrival and Departure (20-mile Alignment)

Station	Mode of Arrival				Mode of Departure		
	Walk	**Bus**	**Drive**	**Total**	**Walk**	**Bus**	**Total**
UH West O'ahu Campus Waianae of North-South Road between Kapolei Parkway and Farrington Highway	31	311	947	1,289	18	52	70
UH West O'ahu at North-South Road and makai of Farrington Highway	144	,1275	0	1,419	187	210	397
Between North-South Road & Fort Weaver Road	368	437	0	805	36	36	72
Farrington Highway & Leokū Street	96	548	0	644	72	320	392
Farrington Highway & Mokuola Street	52	314	0	366	71	153	224
Leeward Community College	32	0	0	32	304	0	304
Kamehameha Highway & Kuala Street	154	1,260	637	2,051	99	141	240
Kamehameha Highway & Kaonohi Street	29	639	0	668	152	457	609
Aloha Stadium	11	101	565	677	55	147	202
Kamehameha Highway & Radford Drive	50	171	0	221	387	504	891
Honolulu International Airport	96	51	0	147	532	63	595
Aolele Street & Lagoon Drive	31	0	0	31	205	135	340
Middle Street Transit Center	16	464	0	480	75	310	385
Dillingham Boulevard & Mokauea Street	148	16	0	164	285	48	333
Dillingham Boulevard & Kōkea Street	69	0	0	69	292	39	331
Ka'aahi Street	63	213	0	276	90	374	464
Nimitz Highway & Kekaulike Streets	132	0	0	132	200	0	200
Nimitz Highway & Fort Street Mall	56	19	0	75	692	57	749
Halekauwila Street & South Street	156	69	0	225	375	940	1,315
Halekauwila Street & Ward Avenue	147	7	0	154	303	13	316
Kona Street & Ke'eaumoku Street	46	508	0	554	419	1,619	2,068
Totals	1,927	6,403	2,149	10,479	4,849	5,618	10,467

Figure 4-3 through Figure 4-6 graphically illustrate projected 2030 a.m. peak-hour link volumes, or the number of passengers on the line between stations, for each of the three Full-corridor Alignments and the 20-mile Alignment. Table 4-18 through Table 4-21 present the same information in tabular format. For all alignment combinations that serve the airport, the maximum link volume is experienced between the Aloha Stadium station and the Kamehameha Highway/Radford Drive station. For the Kalaeloa – Salt Lake – North King – Hotel combination alignment, the maximum link volume occurs between Kaonohi Street and the station on Salt Lake Boulevard at Kahuapa'ani Street. The two-way volumes range from 6,290 riders for the 20-mile Alignment to 7,110 riders for the Kalaeloa – Airport – Dillingham – Halekauwila combination alignment at this maximum load point.

Table 4-22 through Table 4-25 show projected year 2030 a.m. peak-hour station-to-station volumes for each of the four fixed guideway alignment combinations. The station-to-station volumes show the number of people that are projected to use the system between station locations. Across all alignments there are similar usage patterns. The station at Kamehameha Highway and Kuala Street has the maximum volume as an origin station whose heaviest destination stations are the Central Business District, Ala Moana Center, and the future Downtown Kapolei. The high-demand destination stations are Ala Moana Center, UH Mānoa, the Central Business District, and Pearl Harbor. Exact station locations and volume vary depending on the specific alignment; however, the volume patterns remain the same. A short-distance commute is evident from the Pearl City, Waipahu, and 'Ewa areas to the station at the Kapolei Transit Center. For alignments that traverse Kalaeloa, the Kalaeloa stations exhibit relatively low usage volumes in 2030 reflecting the relatively low level of new development assumed for this area by 2030. The 20-mile Alignment shows similar patterns, with the exception of a large increase in volume at the terminal station at Farrington Highway and North-South Road.

Figure 4-3. Fixed Guideway Kalaeloa – Salt Lake – North King – Hotel Combination Alignment – AM Peak Hour Volume on Rail Line

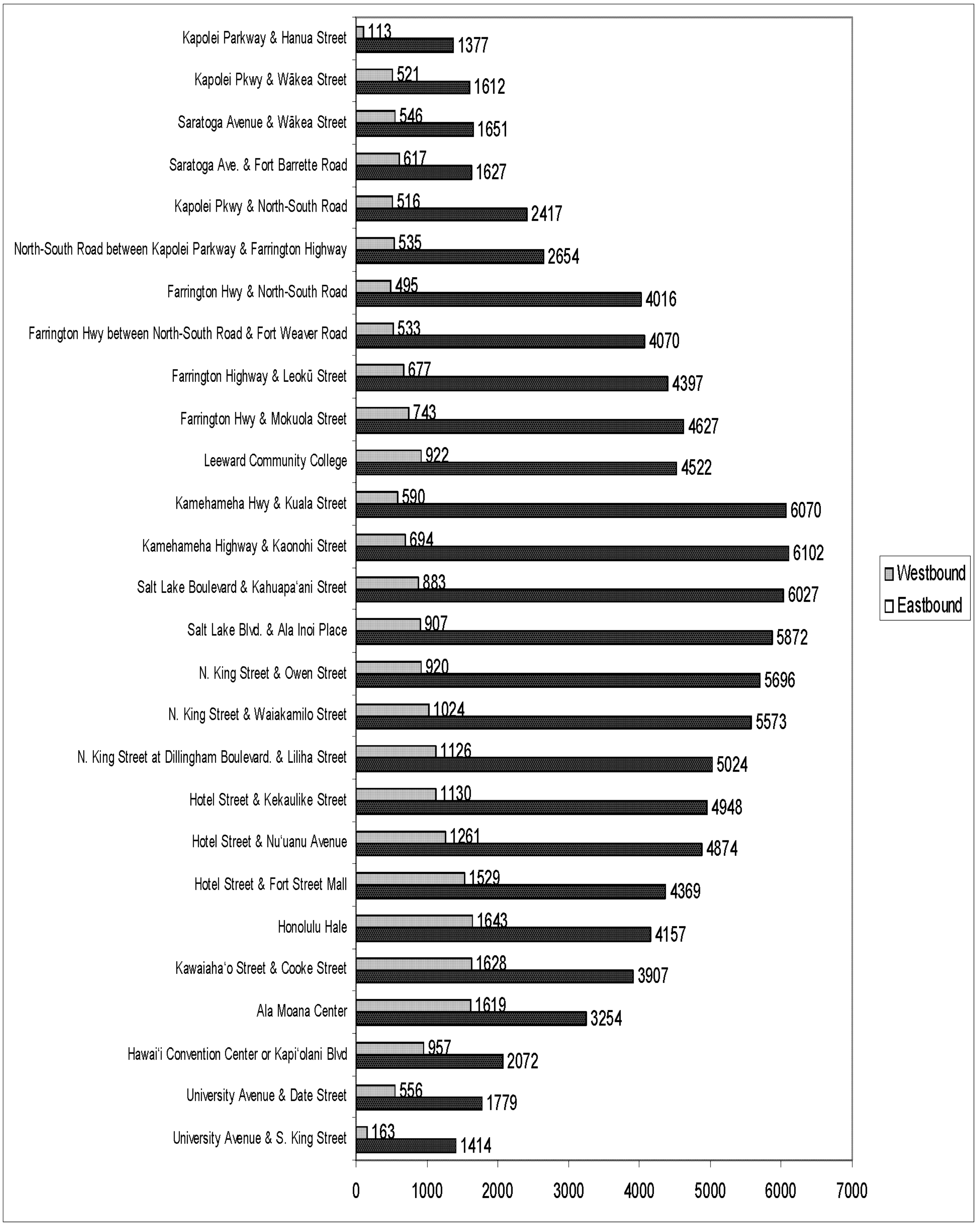

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Figure 4-4. Fixed Guideway Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination Alignment – AM Peak Hour Volume on Rail Line

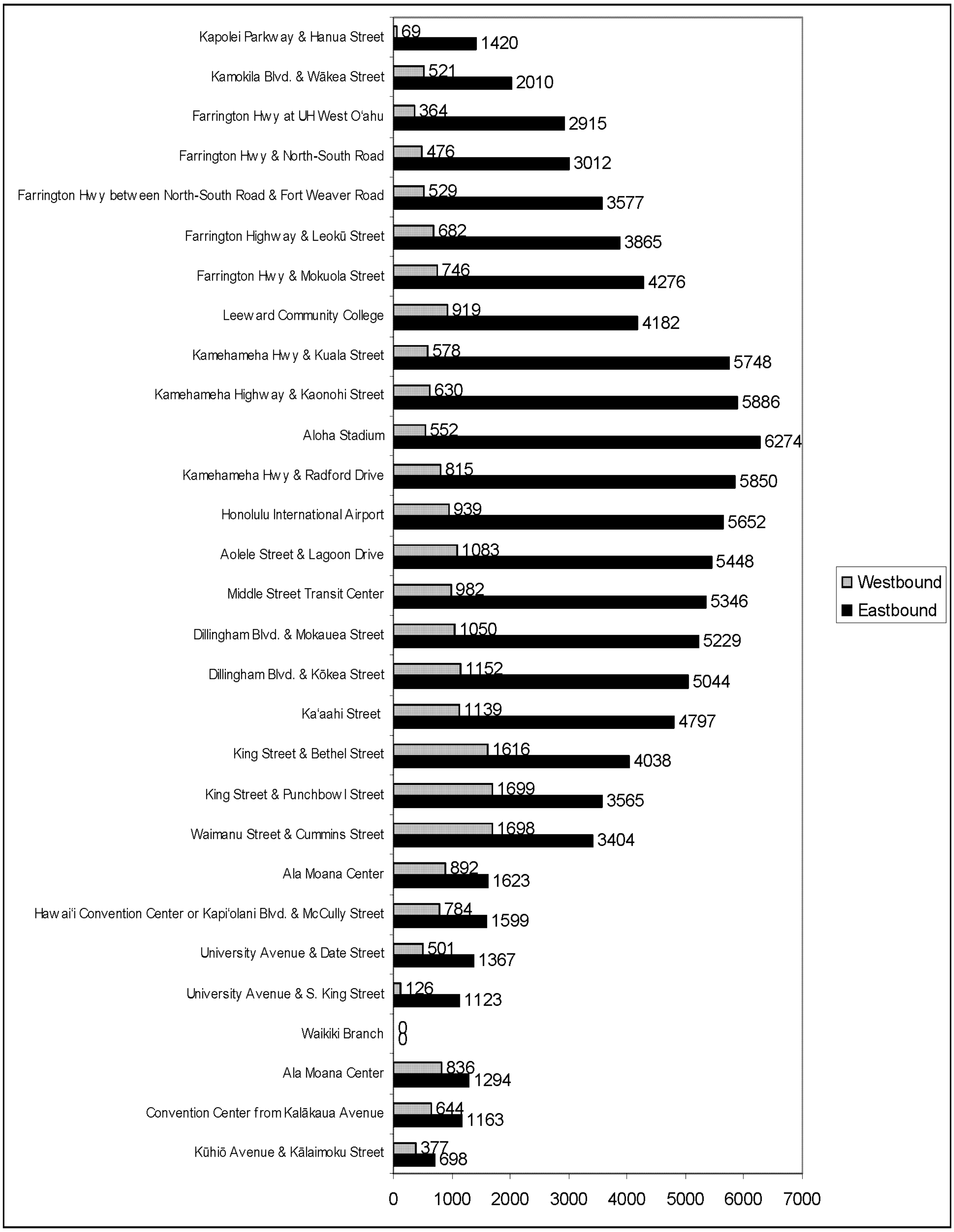


Figure 4-5. Fixed Guideway Kalaeloa – Airport – Dillingham – Halekauwila Combination Alignment – AM Peak Hour Volume on Rail Line

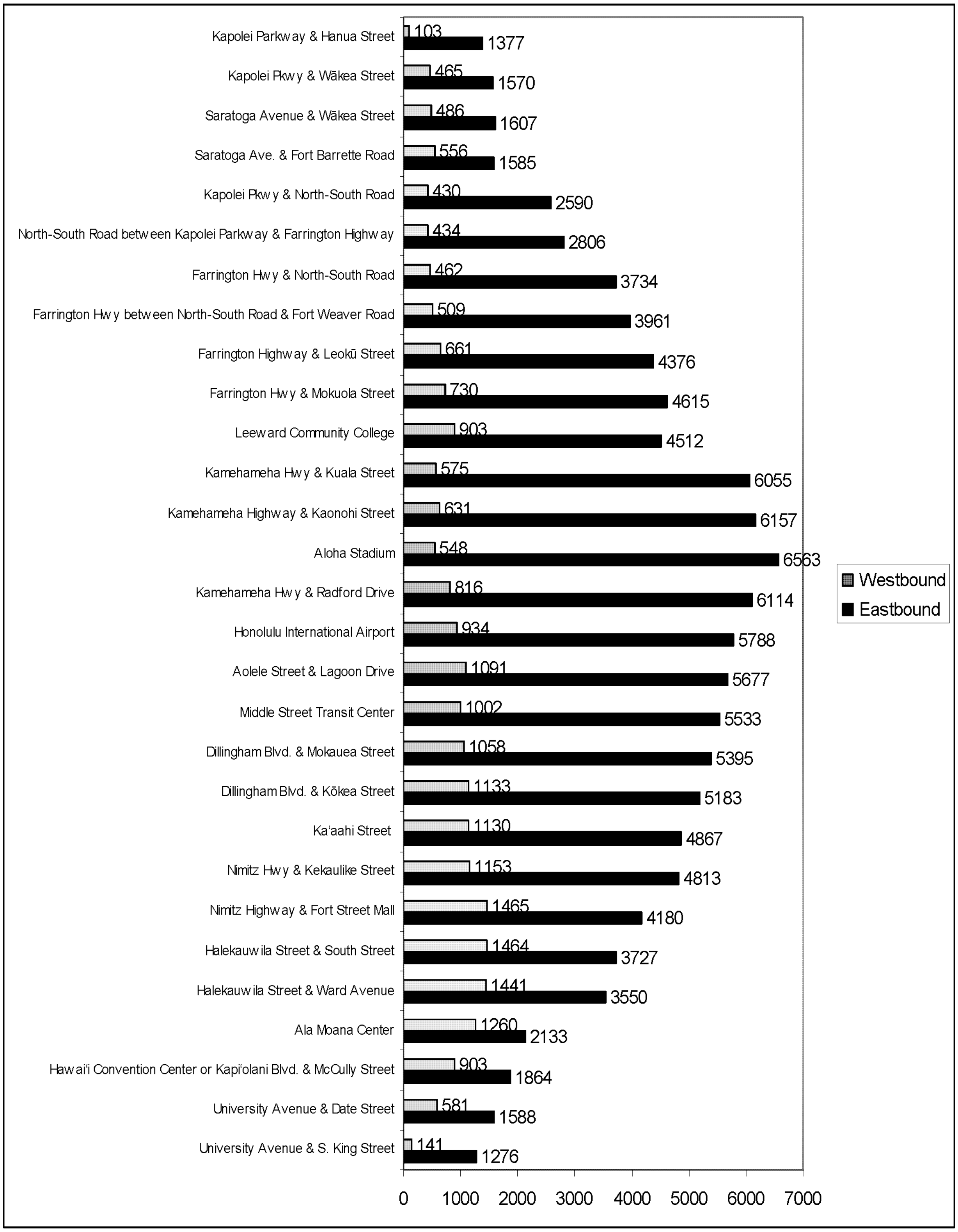


Figure 4-6. Fixed Guideway 20-mile Alignment AM Peak Hour Volume on Rail Line

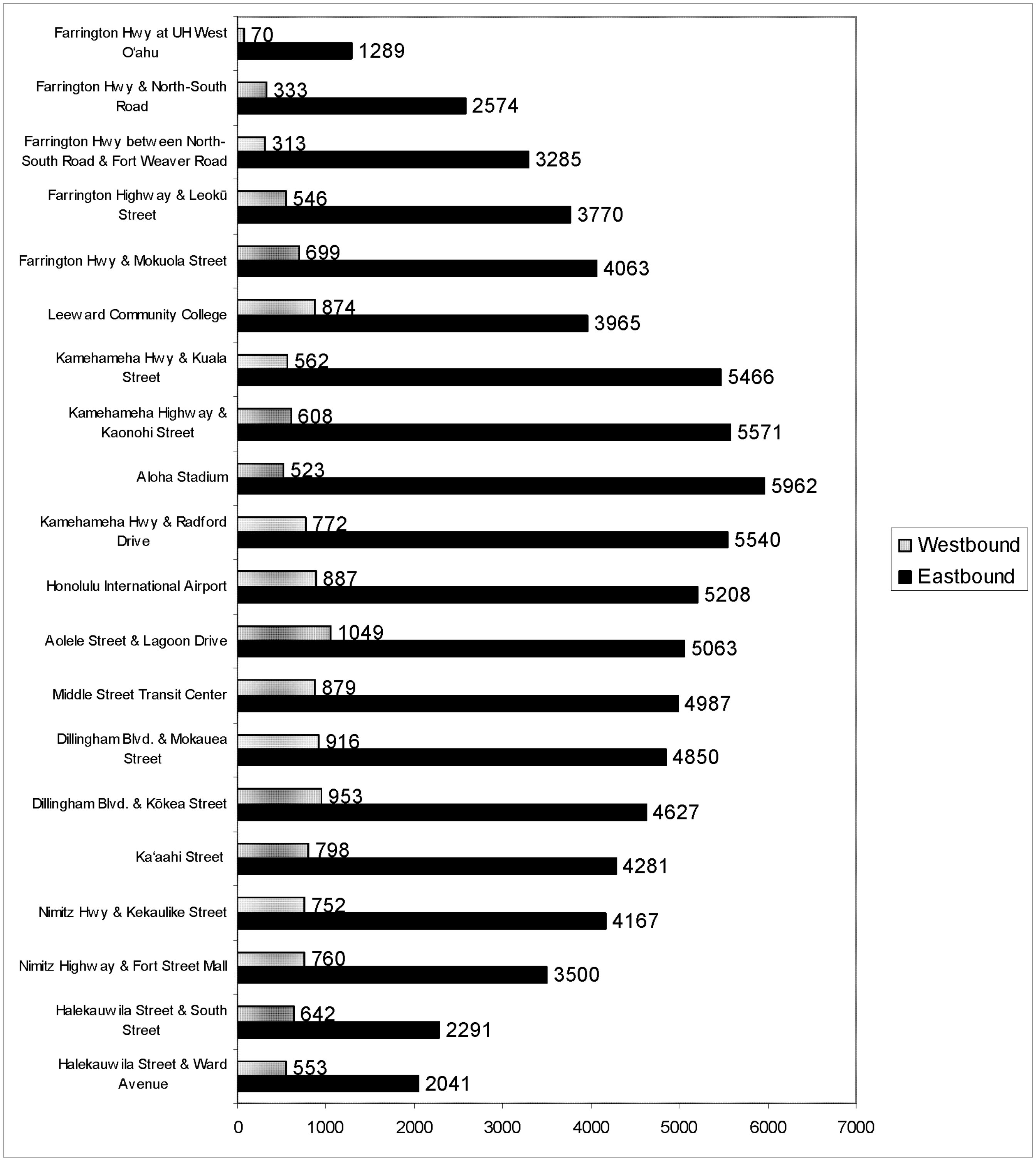


Table 4-18. Year 2030 A.M. Peak Hour Fixed Guideway Link Volumes (Kalaeloa – Salt Lake – North King – Hotel Combination Alignment)

Station A	Station B	A.M. PEAK HOUR		
		A to B	B to A	2-WAY
Kapolei Pkwy & Hanua Street	Kapolei Parkway & Wākea Street	1,380	110	1,490
Kapolei Pkwy & Wākea Street	Saratoga Avenue & Wākea Street	1,610	520	2,130
Saratoga Ave & Wākea Street	Saratoga Ave & Fort Barrette Road	1,650	550	2,200
Saratoga Avenue & Fort Barrette Road	Saratoga Ave & North-South Road	1,630	620	2,250
Saratoga Avenue & North-South Road	North-South Road between Kapolei Parkway & Farrington Highway	2,420	520	2,940
North-South Road between Kapolei Pkwy & Farrington Hwy	Farrington Hwy & North-South Road	2,650	540	3,190
Farrington Highway & North-South Road	Farrington Highway between North-South Road & Fort Weaver Road	4,020	500	4,520
Farrington Hwy between North-South Road & Fort Weaver Road	Farrington Hwy & Leokū Street	4,070	530	4,600
Farrington Hwy & Leokū Street	Farrington Hwy & Mokuola Street	4,400	680	5,080
Farrington Highway & Mokuola Street	Leeward Community College	4,630	740	5,370
Leeward Community College	Kamehameha Hwy & Kuala Street	4,520	920	5,440
Kamehameha Highway & Kuala Street	Kamehameha Hwy & Kaonohi Street	6,070	590	6,660
Kamehameha Highway & Kaonohi Street	Salt Lake Blvd. & Kahuapa‘ani Street	6,100	690	6,790
Salt Lake Boulevard & Kahuapa‘ani Street	Salt Lake Blvd. & Ala Inoi Place	6,030	880	6,910
Salt Lake Blvd. & Ala Inoi Place	N. King Street & Owen Street	5,870	910	6,780
North King Street & Owen Street	N. King Street & Waiakamilo Street	5,700	920	6,620
North King Street & Waiakamilo Street	N. King Street at Dillingham Boulevard & Liliha Street	5,570	1,020	6,590
North King Street at Dillingham Boulevard & Liliha Street	Hotel Street & Kekaulike Street	5,020	1,130	6,150
Hotel Street & Kekaulike Street	Hotel Street & Nu‘uanu Avenue	4,950	1,130	6,080
Hotel Street & Nu‘uanu Avenue	Hotel Street & Fort Street Mall	4,870	1,260	6,130
Hotel Street & Fort Street Mall	Honolulu Hale	4,370	1,530	5,900
Honolulu Hale	Kawaiaha‘o Street & Cooke Street	4,160	1,640	5,800
Kawaiaha‘o Street & Cooke Street	Kona Street & Ke‘eaumoku Street	3,910	1,630	5,540
Kona Street & Ke‘eaumoku Street	Hawai‘i Convention Center	3,250	1,620	4,870
Hawai‘i Convention Center	University Avenue & Date Street	2,070	960	3,030
University Avenue & Date Street	University Avenue & S. King Street	1,780	560	2,340
University Ave & S King Street	UH Lower Campus	1,410	160	1,570

Table 4-19. Year 2030 A.M. Peak Hour Fixed Guideway Link Volumes (Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination Alignment)

Station A	Station B	A.M. PEAK HOUR		
		A to B	B to A	2-WAY
Kapolei Parkway & Hanua Street	Kamokila Blvd. & Wākea Street	1,420	70	1,490
Kamokila Blvd. & Wākea Street	Farrington Hwy at UH West O'ahu	2,010	520	2,530
Farrington Hwy at UH West O'ahu	Farrington Highway & North-South Road	2,920	360	3,280
Farrington Highway & North-South Road	Farrington Hwy between North-South Road & Fort Weaver Road	3,010	480	3,490
Farrington Hwy between North-South Road & Fort Weaver Road	Farrington Hwy & Leokū Street	3,580	530	4,110
Farrington Hwy & Leokū Street	Farrington Hwy & Mokuola Street	3,870	680	4,550
Farrington Hwy & Mokuola Street	Leeward Community College	4,280	750	5,030
Leeward Community College	Kamehameha Hwy & Kuala Street	4,180	920	5,100
Kamehameha Hwy & Kuala Street	Kamehameha Highway & Kaonohi Street	5,750	580	6,330
Kamehameha Highway & Kaonohi Street	Aloha Stadium	5,890	630	6,520
Aloha Stadium	Kamehameha Hwy & Radford Drive	6,270	550	6,820
Kamehameha Highway & Radford Drive	Honolulu International Airport	5,850	820	6,670
Honolulu International Airport	Aolele Street & Lagoon Drive	5,650	940	6,590
Aolele Street & Lagoon Drive	Middle Street Transit Center	5,450	1,080	6,530
Middle Street Transit Center	Dillingham Blvd. & Mokauea Street	5,350	980	6,330
Dillingham Blvd. & Mokauea Street	Dillingham Blvd. & Kōkea Street	5,230	1,050	6,280
Dillingham Blvd. & Kōkea Street	Ka'aahi Street	5,040	1,150	6,190
Ka'aahi Street	King Street & Bethel Street	4,800	1,140	5,940
King Street & Bethel Street	King Street & Punchbowl Street	4,040	1,620	5,660
King Street & Punchbowl Street	Waimanu Street & Cummins Street	3,570	1,700	5,270
Waimanu Street & Cummins Street	Kona Street & Ke'eaumoku Street	3,400	1,700	5,100
Kona Street & Ke'eaumoku Street	Kapi'olani Blvd. & McCully Street	2,920	1,730	4,650
Kapi'olani Blvd. & McCully Street	University Avenue & Date Street	1,600	840	2,440
University Avenue & Date Street	University Avenue & S. King Street	1,370	640	2,010
University Avenue & S King Street	UH Lower Campus	1,120	380	1,500
Waikīkī Branch				
Convention Center at Kalākaua Avenue	Kūhiō Avenue. & Kālaimoku Street	1,160	640	1,800
Kūhiō Avenue & Kālaimoku Street	Kūhiō Avenue & Lili'uokalani Avenue	700	380	1,080

Table 4-20. Year 2030 A.M. Peak Hour Fixed Guideway Link Volumes (Kalaeloa – Airport – Dillingham – Halekauwila Combination Alignment)

Station A	Station B	A.M. PEAK HOUR		
		A to B	**B to A**	**2-WAY**
Kapolei Parkway & Hanua Street	Kapolei Pkwy & Wākea Street	1,380	100	1,480
Kapolei Parkway & Wākea Street	Saratoga Avenue. & Wākea Street	1,570	470	2,040
Saratoga Avenue & Wākea Street	Saratoga Ave & Fort Barrette Rd	1,610	490	2,100
Saratoga Avenue & Fort Barrette Road	Saratoga Avenue & North-South Road	1,590	560	2,150
Saratoga Avenue & North-South Road	North-South Road between Kapolei Pkwy & Farrington Hwy	2,590	430	3,020
North-South Road between Kapolei Pkwy & Farrington Hwy	Farrington Highway & North-South Road	2,810	430	3,240
Farrington Highway & North-South Road	Farrington Hwy between North-South Road & Fort Weaver Road	3,730	460	4,190
Farrington Hwy between North-South Road & Fort Weaver Road	Farrington Hwy & Leokū Street	3,960	510	4,470
Farrington Hwy & Leokū Street	Farrington Hwy & Mokuola Street	4,380	660	5,040
Farrington Hwy & Mokuola Street	Leeward Community College	4,620	730	5,350
Leeward Community College	Kamehameha Hwy & Kuala Street	4,510	900	5,410
Kamehameha Hwy & Kuala Street	Kamehameha Hwy & Kaonohi St	6,060	580	6,640
Kamehameha Hwy & Kaonohi St	Aloha Stadium	6,160	630	6,790
Aloha Stadium	Kamehameha Hwy & Radford Dr	6,560	550	7,110
Kamehameha Hwy & Radford Drive	Honolulu International Airport	6,110	820	6,930
Honolulu International Airport	Aolele Street & Lagoon Drive	5,790	930	6,720
Aolele Street & Lagoon Drive	Middle Street Transit Center	5,680	1,090	6,770
Middle Street Transit Center	Dillingham Blvd. & Mokauea Street	5,530	1,000	6,530
Dillingham Blvd. & Mokauea Street	Dillingham Blvd. & Kōkea Street	5,400	1,060	6,460
Dillingham Blvd. & Kōkea Street	Ka'aahi Street	5,180	1,130	6,310
Ka'aahi Street	Nimitz Hwy & Kekaulike Streets	4,870	1,130	6,000
Nimitz Hwy & Kekaulike Streets	Nimitz Highway & Fort Street Mall	4,810	1,150	5,960
Nimitz Hwy & Fort Street Mall	Halekauwila Street & South Street	4,180	1,470	5,650
Halekauwila Street & South Street	Halekauwila Street & Ward Ave	3,730	1,460	5,190
Halekauwila Street & Ward Ave	Kona Street & Ke'eaumoku Street	3,550	1,440	4,990
Kona Street & Ke'eaumoku Street	Hawai'i Convention Center or Kapi'olani Blvd. & McCully Street	2,130	1,260	3,390
Hawai'i Convention Center or Kapi'olani Blvd. & McCully Street	University Avenue & Date Street	1,860	900	2,760
University Avenue & Date Street	University Avenue & S. King Street	1,590	580	2,170
University Avenue & S King Street	UH Lower Campus	1,280	140	1,420

Table 4-21. Year 2030 A.M. Peak Hour Fixed Guideway Link Volumes (20-mile Alignment)

Station A	Station B	A.M. PEAK HOUR		
		A to B	B to A	2-WAY
UH West O'ahu	Farrington Hwy between North-South Road & Fort Weaver Road	2,280	340	2,620
Farrington Hwy between North-South Road & Fort Weaver Road	Farrington Hwy & Leokū Street	2,720	400	3,120
Farrington Highway & Leokū Street	Farrington Hwy & Mokuola Street	3,520	550	4,070
Farrington Hwy & Mokuola Street	Leeward Community College	3,830	700	4,530
Leeward Community College	Kamehameha Hwy & Kuala Street	3,740	880	4,620
Kamehameha Hwy & Kuala Street	Kamehameha Hwy & Kaonohi St	5,250	560	5,810
Kamehameha Hwy & Kaonohi St	Aloha Stadium	5,370	610	5,980
Aloha Stadium	Kamehameha Highway & Radford Drive	5,760	530	6,290
Kamehameha Hwy & Radford Drive	Honolulu International Airport	5,360	770	6,130
Honolulu International Airport	Aolele Street & Lagoon Drive	5,030	890	5,920
Aolele Street & Lagoon Drive	Middle Street Transit Center	4,890	1,050	5,940
Middle Street Transit Center	Dillingham Blvd. & Mokauea Street	4,830	880	5,710
Dillingham Blvd. & Mokauea Street	Dillingham Blvd. & Kōkea Street	4,690	920	5,610
Dillingham Blvd. & Kōkea Street	Ka'aahi Street	4,480	960	5,440
Ka'aahi Street	Nimitz Hwy & Kekaulike Streets	4,160	800	4,960
Nimitz Highway & Kekaulike Streets	Nimitz Highway & Fort Street Mall	4,050	750	4,800
Nimitz Highway & Fort Street Mall	Halekauwila Street & South Street	3,380	760	4,140
Halekauwila Street & South Street	Halekauwila Street & Ward Ave	2,220	640	2,860
Halekauwila Street & Ward Avenue	Kona Street & Ke'eaumoku Street	1,970	550	2,520

Table 4-22. Year 2030 A.M. Peak Hour Fixed Guideway Station-to-Station Travel Volumes (Kalaeloa – Salt Lake – North King – Hotel Combination Alignment)

Origin	Destination																												
	Kapolei Pkwy & Hanua Street	Kapolei Pkwy & Wākea Street	Saratoga Ave. & Wākea Street	Saratoga Ave. & Fort Barrette Road	Kapolei Pkwy & North-South Road	North-South Road between Kapolei Pkwy & Farrington Hwy	Farrington Hwy & North-South Road	Farrington Hwy between North-South Road & Fort Weaver Road	Farrington Hwy & Leokū Street	Farrington Hwy & Mokuola Street	Leeward Community College	Kamehameha Hwy & Kuala Street	Kamehameha Hwy & Kaonohi Street	Salt Lake Blvd. & Kahuapa'ani Street	Salt Lake Blvd. & Ala Inoi Place	N. King Street & Owen Street	N. King Street & Waiakamilo Street	N. King Street at Dillingham Blvd. & Liliha Street	Hotel Street & Kekaulike Street	Hotel Street & Nu'uanu Ave.	Hotel Street & Fort Street Mall	Honolulu Hale	Kawaiaha'o Street & Cooke Street	Ala Moana Center	Hawai'i Convention Center or Kapi'olani Blvd. & McCully Street	University Ave & Date Street	University Ave. & S. King Street	UH Mānoa	Total
Kapolei Pkwy & Hanua Street		56	10	23	10	14	37	9	43	27	28	39	75	94	69	41	21	99	10	23	107	32	45	81	145	28	34	175	**1,377**
Kapolei Pkwy & Wākea Street	0		13	7	2	4	9	1	13	8	8	12	26	19	13	7	9	21	2	4	12	5	9	9	22	7	7	42	**291**
Saratoga Ave. & Wākea Street	3	8		3	1	2	5	1	3	1	2	2	3	3	3	1	1	4	0	1	3	2	2	2	7	1	1	9	**72**
Saratoga Ave. & Fort Barrette Road	0	1	0		0	0	1	0	0	0	0	1	1	1	0	0	0	1	0	0	1	0	0	0	1	0	0	1	**8**
Kapolei Pkwy & North-South Road	21	106	0	15		25	46	19	41	14	14	22	45	50	34	25	9	61	5	12	67	11	16	57	110	16	17	87	**945**
North-South Road between Kapolei Pkwy & Farrington Hwy	10	18	6	5	0		10	1	5	6	12	12	26	21	14	8	8	24	2	3	15	7	11	10	29	8	6	42	**320**
Farrington Hwy & North-South Road	25	87	12	27	24	25		28	69	38	33	52	120	104	72	48	29	120	11	22	108	30	42	84	191	35	37	197	**1,670**
Farrington Hwy between North-South Road & Fort Weaver Road	1	1	1	1	1	1	5		9	6	4	5	12	8	6	3	3	9	1	1	7	3	4	4	11	3	3	14	**125**
Farrington Hwy & Leokū Street	5	6	2	3	2	4	11	5		5	14	22	32	34	22	15	14	36	4	11	40	16	17	34	95	13	16	69	**546**
Farrington Hwy & Mokuola Street	5	18	2	2	1	4	14	5	6		15	11	24	31	15	11	8	19	3	7	31	11	11	21	61	7	8	41	**395**
Leeward Community College	1	1	0	0	0	0	1	0	2	4		3	5	2	1	0	0	1	0	1	1	0	0	1	4	0	1	1	**32**
Kamehameha Hwy & Kuala Street	24	75	5	10	8	10	54	23	86	53	74		159	197	100	57	31	108	18	45	189	51	65	133	238	44	47	251	**2,153**
Kamehameha Hwy & Kaonohi Street	4	16	1	3	2	3	16	4	15	10	29	7		109	33	38	28	39	11	16	64	20	32	28	36	17	14	75	**669**
Salt Lake Blvd. & Kahuapa'ani Street	4	13	0	2	1	2	12	4	20	23	19	28	79		70	66	24	85	13	22	113	18	23	42	43	15	15	48	**805**
Salt Lake Blvd. & Ala Inoi Place	2	6	0	1	0	1	6	1	5	6	9	9	23	40		20	18	38	7	14	57	17	25	22	23	11	8	37	**405**
N. King Street & Owen Street	1	5	0	0	0	1	4	1	4	3	7	7	14	47	13		7	9	5	6	23	8	19	20	25	10	9	25	**270**
N. King Street & Waiakamilo Street	0	1	0	0	0	0	2	0	1	1	3	2	5	13	5	3		3	3	5	16	5	9	11	11	5	6	13	**123**
N. King Street at Dillingham Blvd. & Liliha Street	1	3	0	0	0	0	3	0	3	2	4	2	7	28	7	4	6		2	3	4	5	15	20	29	13	14	24	**199**
Hotel Street & Kekaulike Street	0	1	0	0	0	0	1	0	1	1	2	1	4	12	3	6	6	1		0	1	1	3	5	4	2	2	3	**61**
Hotel Street & Nu'uanu Ave.	0	2	0	0	0	0	1	0	1	1	2	2	4	13	3	7	6	2	0		1	4	9	23	32	15	16	23	**166**
Hotel Street & Fort Street Mall	3	14	1	1	1	2	11	2	10	6	17	9	21	73	24	12	19	2	3	0		10	21	42	92	32	34	123	**585**
Honolulu Hale	0	2	0	0	0	0	1	0	1	1	1	1	3	7	2	3	2	3	1	1	2		2	8	14	5	6	6	**72**
Kawaiaha'o Street & Cooke Street	1	4	0	0	0	1	4	1	3	3	3	4	9	30	12	17	23	29	5	8	33	8		19	43	14	30	26	**327**
Ala Moana Center	1	4	1	0	0	0	3	1	4	2	3	4	9	24	8	9	10	11	4	10	37	9	12		2	4	10	7	**188**
Hawai'i Convention Center or Kapi'olani Blvd. & McCully Street	2	6	0	0	0	1	6	1	9	6	6	7	14	55	27	24	29	63	12	108	209	58	69	37		11	26	49	**835**
University Ave & Date Street	0	3	0	0	0	0	2	1	2	2	3	3	8	23	13	15	15	30	10	21	102	33	42	50	36		3	21	**440**
University Ave. & S. King Street	1	3	0	1	0	0	2	1	3	2	3	4	8	24	12	13	17	26	7	21	81	28	45	52	33	9		3	**397**
UH Mānoa	1	4	0	0	0	1	3	0	3	1	1	2	5	8	4	5	5	10	3	7	34	10	12	16	18	6	1		**163**
Total	**113**	**464**	**58**	**104**	**55**	**102**	**267**	**109**	**363**	**231**	**317**	**273**	**740**	**1,070**	**584**	**460**	**349**	**851**	**141**	**372**	**1,358**	**398**	**562**	**832**	**1,355**	**333**	**370**	**1,414**	

Table 4-23. Year 2030 A.M. Peak Hour Fixed Guideway Station-to-Station Travel Volumes (Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination Alignment)

Origin	Destination: Kapolei Pkwy & Hanua Street	Kamokila Blvd. & Wākea Street	Farrington Hwy at UH West O'ahu	Farrington Hwy & North-South Road	Farrington Hwy between North-South Road & Fort Weaver Road	Farrington Hwy & Leokū Street	Farrington Hwy & Mokuola Street	Leeward Community College	Kamehameha Hwy & Kuala Street	Kamehameha Hwy & Kaonohi Street	Aloha Stadium	Kamehameha Hwy & Radford Drive	Honolulu International Airport	Aolele Street & Lagoon Drive	Middle Street Transit Center	Dillingham Blvd. & Mokauea Street	Dillingham Blvd. & Kōkea Street	Ka'aahi Street	King Street & Bethel Street	King Street & Punchbowl Street	Waimanu Street & Cummins Street	Ala Moana Center	Hawai'i Convention Center or Kapi'olani Blvd. & McCully Street	University Ave & Date Street	University Ave. & S. King Street	UH Lower Campus	**Waikīkī Branch**	Convention Center from Kalākaua Ave.	Kūhiō Ave. & Kālaimoku Street	Kūhiō Ave. & Lili'uokalani Ave.	**Total**
Kapolei Pkwy & Hanua Street		57	4	38	16	50	27	29	43	75	22	83	54	53	32	28	29	54	121	92	31	90	6	28	29	167		19	50	89	**1,420**
Kamokila Blvd. & Wākea Street	0		0	5	6	21	16	17	24	52	13	34	19	25	18	12	16	39	51	38	14	22	3	16	14	91		10	34	38	**648**
Farrington Hwy at UH West O'ahu	12	158		25	25	50	18	16	28	59	14	49	25	30	21	18	18	31	71	62	14	67	2	18	16	101		13	40	79	**1,080**
Farrington Hwy & North-South Road	5	17	0		4	16	7	4	8	16	3	9	4	6	5	3	4	10	8	8	3	5	1	4	3	22		1	5	6	**188**
Farrington Hwy between North-South Road & Fort Weaver Road	6	9	0	4		7	16	21	26	54	12	36	18	23	17	12	17	35	50	36	13	23	2	17	14	92		9	32	35	**636**
Farrington Hwy & Leokū Street	4	19	0	11	5		6	12	19	26	7	23	12	15	12	7	11	20	42	25	8	27	3	12	11	49		9	37	39	**472**
Farrington Hwy & Mokuola Street	5	26	1	13	6	7		18	15	31	11	36	17	19	13	11	14	20	54	27	12	28	3	11	12	61		11	38	38	**559**
Leeward Community College	0	1	0	0	0	2	4		3	5	1	2	0	1	0	0	1	1	2	1	0	1	0	0	1	1		0	2	2	**32**
Kamehameha Hwy & Kuala Street	18	109	6	52	26	92	51	73		148	44	159	74	76	45	39	43	56	198	119	42	125	8	38	36	230		33	80	138	**2,159**
Kamehameha Hwy & Kaonohi Street	4	21	1	15	7	16	10	29	7		10	109	44	44	24	30	30	21	76	39	18	24	2	15	11	69		7	14	17	**714**
Aloha Stadium	3	14	2	8	4	17	19	16	23	49		62	31	33	34	37	29	29	89	52	11	41	1	12	7	31		5	5	18	**679**
Kamehameha Hwy & Radford Drive	1	5	1	2	2	7	6	5	9	17	3		13	10	10	12	11	14	35	16	7	8	1	5	4	17		4	8	4	**235**
Honolulu International Airport	1	4	0	1	1	4	3	3	4	5	2	7		2	2	7	9	8	27	11	7	10	1	3	3	11		3	4	5	**150**
Aolele Street & Lagoon Drive	0	3	0	1	1	2	2	3	3	7	1	11	7		2	9	11	11	34	15	8	10	1	4	3	12		3	5	5	**174**
Middle Street Transit Center	2	10	1	5	2	6	5	12	7	13	11	58	29	30		8	9	2	21	13	11	13	1	6	5	18		3	11	9	**321**
Dillingham Blvd. & Mokauea Street	0	2	0	2	1	2	1	3	1	7	4	22	9	13	4		3	6	31	17	9	14	1	5	4	12		3	6	5	**190**
Dillingham Blvd. & Kōkea Street	0	2	0	1	1	1	1	1	1	4	2	8	5	7	3	1		1	14	11	6	8	1	5	4	8		2	5	5	**107**
Ka'aahi Street	1	7	0	4	2	5	2	9	3	1	5	38	21	22	2	5	1		0	0	11	19	3	10	9	24		5	14	15	**241**
King Street & Bethel Street	1	7	0	2	2	4	2	5	3	8	4	26	13	18	11	17	5	0		3	16	32	4	15	18	26		8	19	24	**295**
King Street & Punchbowl Street	0	5	0	2	1	3	1	3	2	6	3	19	9	13	10	13	12	5	7		3	12	2	7	10	12		3	24	37	**224**
Waimanu Street & Cummins Street	1	2	0	1	1	2	1	2	1	4	3	12	6	8	7	11	16	9	30	7		8	4	6	13	16		3	13	20	**207**
Ala Moana Center	1	6	0	2	2	5	2	5	5	9	7	29	14	18	8	22	15	6	34	10	5		1	7	9	22		1	13	50	**306**
Hawai'i Convention Center or Kapi'olani Blvd. & McCully Street	0	1	0	0	0	0	0	1	1	3	1	5	3	4	3	5	6	7	45	14	11	12		1	7	19		0	0	0	**152**
University Ave & Date Street	0	2	0	1	1	2	1	3	3	6	2	18	7	9	9	13	19	17	82	29	21	43	3		1	10		0	0	0	**301**
University Ave. & S. King Street	0	6	0	2	1	4	2	4	4	8	6	21	13	16	10	17	20	20	93	29	34	49	10	6		0		0	0	0	**376**
UH Lower Campus	1	5	0	1	2	3	1	1	2	4	1	5	2	3	3	5	5	6	33	11	8	17	4	2	0			0	0	0	**126**
Waikīkī Branch																															
Convention Center from Kalākaua Ave.	1	2	0	1	1	2	3	2	2	4	4	12	7	8	6	10	15	10	80	20	7	8	0	0	0	0			7	17	**227**
Kūhiō Ave. & Kālaimoku Street	1	4	0	1	1	5	2	1	2	4	7	15	9	8	5	10	10	17	85	31	17	30	0	0	0	0		2		1	**269**
Kūhiō Ave. & Lili'uokalani Ave.	0	3	0	1	1	3	2	2	2	5	11	14	6	6	5	11	16	18	117	46	20	76	0	0	0	0		8	0		**377**
Total	**69**	**509**	**18**	**202**	**124**	**338**	**211**	**299**	**252**	**629**	**212**	**923**	**472**	**521**	**322**	**374**	**395**	**474**	**1,531**	**779**	**367**	**825**	**67**	**251**	**244**	**1,123**		**166**	**467**	**698**	

Table 4-24. Year 2030 A.M. Peak Hour Fixed Guideway Station-to-Station Travel Volumes (Kalaeloa – Airport – Dillingham – Halekauwila Combination Alignment)

Origin	Destination: Kapolei Pkwy & Hanua Street	Kapolei Pkwy & Wākea Street	Saratoga Ave. & Wākea Street	Saratoga Ave. & Fort Barrette Road	Kapolei Pkwy & North-South Road	North-South Road between Kapolei Pkwy & Farrington Hwy	Farrington Hwy & North-South Road	Farrington Hwy between North-South Road & Fort Weaver Road	Farrington Hwy & Leokū Street	Farrington Hwy & Mokuola Street	Leeward Community College	Kamehameha Hwy & Kuala Street	Kamehameha Hwy & Kaonohi Street	Aloha Stadium	Kamehameha Hwy & Radford Drive	Honolulu International Airport	Aolele Street & Lagoon Drive	Middle Street Transit Center	Dillingham Blvd. & Mokauea Street	Dillingham Blvd. & Kōkea Street	Ka'aahi Street	Nimitz Hwy & Kekaulike Streets	Nimitz Hwy & Fort Street Mall	Halekauwila Street & South Street	Halekauwila Street & Ward Ave.	Ala Moana Center	Kapi'olani Blvd. & McCully Street	University Ave & Date Street	University Ave. & S. King Street	UH Mānoa	Total
Kapolei Pkwy & Hanua Street		57	11	21	11	17	22	8	44	26	28	39	71	20	78	67	34	33	24	28	65	20	85	74	33	194	29	30	31	176	**1,377**
Kapolei Pkwy & Wākea Street	0		14	6	3	4	3	1	12	7	6	10	22	5	12	7	6	8	4	6	13	3	14	9	4	18	7	6	7	34	**250**
Saratoga Ave. & Wākea Street	3	8		2	1	2	4	1	3	1	2	2	3	1	2	2	1	1	1	2	2	1	4	2	1	7	2	1	1	9	**72**
Saratoga Ave. & Fort Barrette Road	0	1	0		0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	**9**
Kapolei Pkwy & North-South Road	24	124	0	17		39	49	16	50	17	19	27	53	14	50	32	25	23	18	18	54	12	51	61	21	192	15	21	21	122	**1,185**
North-South Road between Kapolei Pkwy & Farrington Hwy	11	18	10	9	0		1	1	4	6	12	13	25	7	17	13	7	9	5	9	17	3	19	14	5	27	9	8	5	41	**327**
Farrington Hwy & North-South Road	10	25	5	18	23	19		19	58	28	22	35	77	18	55	36	28	29	20	22	60	11	56	53	20	158	24	23	24	129	**1,108**
Farrington Hwy between North-South Road & Fort Weaver Road	1	1	1	1	1	1	1		9	11	9	15	29	7	16	10	7	10	5	8	18	3	16	11	5	22	8	8	7	41	**282**
Farrington Hwy & Leokū Street	5	6	2	3	1	4	8	6		5	16	26	37	8	34	23	15	17	11	17	28	10	51	30	14	103	35	17	16	83	**630**
Farrington Hwy & Mokuola Street	5	18	2	3	1	4	12	5	7		16	10	22	9	26	18	7	9	8	9	11	7	32	14	7	60	21	8	8	39	**399**
Leeward Community College	1	1	0	0	0	0	0	0	2	4		3	5	1	2	1	0	1	0	0	1	0	1	1	0	3	2	0	0	1	**32**
Kamehameha Hwy & Kuala Street	23	74	6	10	8	12	48	21	87	53	74		145	43	160	100	51	51	40	44	77	32	139	104	45	307	47	45	44	248	**2,139**
Kamehameha Hwy & Kaonohi Street	5	17	1	3	1	3	14	4	15	10	29	7		11	103	61	24	28	31	29	18	17	60	33	19	44	14	17	11	74	**701**
Aloha Stadium	4	10	0	1	1	2	8	4	18	20	16	22	50		62	51	30	35	38	29	60	12	49	45	17	59	4	11	9	36	**704**
Kamehameha Hwy & Radford Drive	1	4	0	0	0	1	3	2	7	6	5	9	17	3		16	4	10	11	11	12	7	29	12	7	16	8	5	4	19	**228**
Honolulu International Airport	1	5	0	0	0	1	2	1	5	3	3	4	7	3	6		1	2	7	9	6	7	21	10	6	19	4	4	4	12	**153**
Aolele Street & Lagoon Drive	0	2	0	0	0	0	1	0	1	1	3	3	6	0	5	6		2	9	11	10	7	26	13	8	17	6	5	4	14	**159**
Middle Street Transit Center	2	6	0	1	0	1	5	2	6	4	12	8	12	12	54	28	28		9	8	1	5	11	12	11	22	10	7	8	19	**306**
Dillingham Blvd. & Mokauea Street	0	2	0	0	0	0	2	0	2	2	3	2	7	4	21	9	13	4		3	5	6	19	13	9	21	5	6	4	13	**176**
Dillingham Blvd. & Kōkea Street	0	1	0	0	0	0	1	0	1	1	1	1	3	2	7	4	7	2	1		1	2	5	7	6	11	3	4	4	7	**85**
Ka'aahi Street	1	6	0	1	0	1	4	1	5	3	9	4	4	6	47	22	24	3	10	4		2	4	8	14	40	20	13	15	28	**301**
Nimitz Hwy & Kekaulike Streets	1	2	0	0	0	0	1	0	1	2	4	2	4	2	21	10	13	6	10	4	0		1	3	9	38	12	12	15	22	**195**
Nimitz Hwy & Fort Street Mall	0	4	0	0	0	0	2	1	4	1	2	2	4	2	9	5	7	2	5	2	1	1		1	3	13	8	8	10	16	**113**
Halekauwila Street & South Street	0	3	0	0	0	0	2	0	3	2	3	2	6	4	22	10	15	11	14	14	10	5	7		2	30	12	8	15	10	**212**
Halekauwila Street & Ward Ave.	1	3	0	0	0	0	2	1	2	2	3	2	6	3	16	8	11	9	13	10	17	8	14	4		20	14	14	20	23	**225**
Ala Moana Center	2	8	1	0	0	1	4	1	9	4	4	6	13	18	43	18	22	15	23	24	36	26	38	22	7		2	5	10	9	**373**
Hawai'i Convention Center or Kapi'olani Blvd. & McCully Street	1	2	0	0	0	0	2	1	3	4	3	3	6	6	20	14	14	12	16	15	29	26	130	38	26	21		4	16	33	**448**
University Ave & Date Street	1	2	0	0	0	1	1	1	2	2	3	3	6	4	19	8	11	10	13	13	25	16	68	29	28	55	13		2	12	**348**
University Ave. & S. King Street	1	4	0	1	0	0	3	1	4	3	4	6	9	4	26	14	16	14	16	17	28	18	83	32	41	73	16	9		3	**444**
UH Mānoa	1	5	0	0	0	1	2	1	4	1	1	2	5	2	8	3	5	4	7	5	8	5	25	8	10	17	8	4	1		**141**
Total	**103**	**419**	**56**	**101**	**54**	**115**	**208**	**101**	**368**	**228**	**309**	**267**	**655**	**215**	**944**	**598**	**428**	**361**	**370**	**373**	**613**	**272**	**1,058**	**664**	**379**	**1,609**	**359**	**302**	**316**	**1,276**	

Table 4-25. Year 2030 A.M. Peak Hour Fixed Guideway Station-to-Station Travel Volumes (20-mile Alignment)

Origin	Destination: North-South Road between Kapolei Pkwy & Farrington Hwy	Farrington Hwy & North-South Road	Farrington Hwy between North-South Road & Fort Weaver Road	Farrington Hwy & Leokū Street	Farrington Hwy & Mokuola Street	Leeward Community College	Kamehameha Hwy & Kuala Street	Kamehameha Hwy & Kaonohi Street	Aloha Stadium	Kamehameha Hwy & Radford Drive	Honolulu International Airport	Aolele Street & Lagoon Drive	Middle Street Transit Center	Dillingham Blvd. & Mokauea Street	Dillingham Blvd. & Kōkea Street	Ka'aahi Street	Nimitz Hwy & Kekaulike Streets	Nimitz Hwy & Fort Street Mall	Halekauwila Street & South Street	Halekauwila Street & Ward Ave.	Ala Moana Center	Total
North-South Road between Kapolei Pkwy & Farrington Hwy		231	49	149	48	45	72	146	37	117	91	34	63	39	46	135	22	113	322	43	541	**2,344**
Farrington Hwy & North-South Road	12		12	51	30	67	89	169	45	169	143	64	81	53	72	124	46	216	465	90	581	**2,579**
Farrington Hwy between North-South Road & Fort Weaver Road	32	76		46	30	46	54	104	29	76	56	32	42	25	39	71	20	99	245	39	302	**1,464**
Farrington Hwy & Leokū Street	6	34	4		3	33	48	71	19	66	43	27	35	22	31	53	21	97	180	33	343	**1,170**
Farrington Hwy & Mokuola Street	3	11	3	4		30	23	41	14	49	33	14	17	17	16	23	12	63	87	16	188	**665**
Leeward Community College	1	2	0	3	8		6	9	1	3	2	0	1	1	1	0	0	3	3	1	11	**58**
Kamehameha Hwy & Kuala Street	30	179	22	209	137	135		287	79	287	202	58	107	67	85	150	61	248	505	91	792	**3,732**
Kamehameha Hwy & Kaonohi Street	10	47	5	45	23	53	13		20	186	103	39	53	54	56	29	31	109	149	37	155	**1,216**
Aloha Stadium	5	27	5	34	44	29	41	90		112	95	33	71	67	52	112	23	90	119	26	155	**1,231**
Kamehameha Hwy & Radford Drive	3	10	3	17	14	9	14	30	4		30	6	21	19	20	20	13	51	44	15	62	**402**
Honolulu International Airport	2	7	3	14	8	5	7	12	4	13		3	5	13	15	10	12	39	31	13	53	**268**
Aolele Street & Lagoon Drive	0	1	0	2	1	0	1	2	0	2	2		4	3	3	5	3	5	5	2	16	**57**
Middle Street Transit Center	5	19	3	24	13	28	18	35	25	114	66	75		36	33	7	22	64	65	36	99	**786**
Dillingham Blvd. & Mokauea Street	1	5	1	5	3	5	3	11	7	37	14	22	11		6	14	13	33	31	18	54	**292**
Dillingham Blvd. & Kōkea Street	1	3	1	4	1	3	1	6	2	14	8	9	5	1		2	3	10	15	10	29	**128**
Ka'aahi Street	3	20	4	24	9	22	12	9	15	100	55	51	7	34	12		3	7	20	23	71	**501**
Nimitz Hwy & Kekaulike Streets	1	5	1	5	3	7	4	7	4	32	17	23	11	15	7	1		2	7	15	75	**240**
Nimitz Hwy & Fort Street Mall	2	5	2	12	4	4	2	8	3	15	9	11	5	10	6	1	1		3	5	29	**136**
Halekauwila Street & South Street	3	12	4	17	6	7	6	14	9	50	22	27	24	34	31	29	8	9		6	91	**409**
Halekauwila Street & Ward Ave.	1	4	1	6	3	4	3	9	4	22	12	13	20	18	16	29	15	26	11		64	**281**
Ala Moana Center	7	27	8	43	24	21	19	46	43	157	79	74	34	80	55	33	35	79	86	56		**1,006**
Total	**126**	**723**	**132**	**713**	**410**	**553**	**437**	**1,109**	**367**	**1,620**	**1,082**	**616**	**615**	**609**	**602**	**846**	**365**	**1,363**	**2,392**	**575**	**3,711**	**18,965**

Exclusive Right-of-Way Analysis

The percentage of each transit alternative that is contained in exclusive right-of-way provides insight into the potential for reliable transit travel times. If an alternative provides significant separation from interference with regular traffic flow, then it will not be affected by traffic congestion and will provide more reliable travel times. Each of the four alternatives considered in this analysis have distinct amounts of exclusive right-of-way that aid in distinguishing among them. The corridor is 23 miles long; the focus of the exclusive right-of-way analysis considers the study corridor for comparison of alternatives.

The No Build and Transportation System Management Alternatives have no exclusive right-of-way identified for transit service. While the express bus service would operate in the a.m. and p.m. zipper lanes and in HOV lanes for both alternatives, these lanes are not exclusively reserved for transit operations. Nor are these lanes controlled dynamically to regulate the flow of traffic. Therefore, neither of these alternatives provides any exclusive right-of-way for transit vehicles.

The Managed Lane Alternative would be constructed as a grade-separated facility with no interference from cross streets or pedestrian traffic. It is considered to provide exclusive right-of-way service for transit vehicles because transit vehicles would have first priority on the facility. As such, the Managed Lane Alternative provides between 12 and 14 miles of exclusive right-of-way service within the 23-mile corridor, which is comparable to 52% to 61% exclusive right-of-way.

The Fixed Guideway Alternative would also be constructed as a mostly exclusive right-of-way facility. There are portions of alignment options that are at-grade with pedestrian and vehicular crossings. All of the fixed guideway alignments would be in reserved right-of-way; however, the portions with at-grade crossings are not considered exclusive right-of-way. Given these considerations, there are various percentages of exclusive right-of-way for the Fixed Guideway Alternative depending on the alignment option. In general, the fixed guideway offers between 82% and 99% of exclusive right-of-way coverage throughout the corridor. For the three combination alternatives, the total mileage and percent in exclusive right-of-way is shown in Table 4-26.

In summary, the Fixed Guideway Alternative offers the highest percentage of exclusive right-of-way of all of the alternatives. As such, it can be concluded that the Fixed Guideway Alternative options would provide the most reliability for travel within the corridor when compared with the other alternatives. Table 4-27 summarizes the mileage and percent of comparable exclusive right-of-way.

Table 4-26. Percent of Fixed Guideway Combination Options in Exclusive Right-of-Way

Fixed Guideway	# Miles Total	# Miles Exclusive ROW	% Exclusive ROW
Kalaeloa – Salt Lake – North King – Hotel			
at-grade	26.16	21.59	82%
elevated	26.16	25.83	99%
Kamokila – Airport – Dillingham – King with a Waikīkī Branch			
at-grade	24.86	23.22	93%
elevated	24.86	24.53	99%
Kalaeloa – Airport – Dillingham – Halekauwila			
at-grade	25.62	23.99	93%
elevated	25.62	25.29	99%

Table 4-27. Percent of Alternative in Exclusive Right-of-Way

Alternative	# Corridor Miles	# Miles Exclusive ROW		% of Facility in Exclusive ROW
No Build	23	0		0%
TSM	23	0		0%
Managed Lane	23	Min	12	52%
		Max	14	61%
Fixed Guideway*	26	Min	21.6	93%
		Max	25.8	99%

*Note: The fixed guideway alignments are longer than the straight-line length of the corridor because they wind through areas of the corridor.

Chapter 5 Roadway Travel Impacts

This chapter describes the expected future roadway travel conditions for each of the alternatives, including systemwide measures such as vehicle miles traveled (VMT), vehicle hours traveled (VHT), and vehicle hours of delay (VHD), and more localized measures such as projected peak-hour screenline volumes and levels-of-service and peak-period travel times between selected corridor origins and destinations.

Systemwide Roadway Travel Statistics

This section describes the projected future islandwide roadway travel conditions resulting from each of the study alternatives. Measures assessed include VMT, VHT, and VHD. The amount of VMT and VHT are indicators of how much people are using their private automobiles for travel. Lower values for these measures indicate a more efficient and environmentally friendly transportation system. VHD is a measure that reflects the amount of congestion present in the system. Lower VHD values indicate less congestion on the transportation network.

Table 5-1 presents the three systemwide transportation measures of daily VMT, VHT, and VHD for each alternative. The change in systemwide VHD is also shown graphically in Figure 5-1.

Alternative 1: No Build

Table 5-1 shows that all three systemwide travel measures are expected to increase significantly between 2005 and the 2030 No Build Alternative. Under the 2030 No Build Alternative, approximately 13,971,000 VMT per day are projected on the future 2030 transportation system, including major freeways, expressways, arterials, and collectors. Approximately 395,000 VHT per day may be spent on traveling on the major transportation network using private automobiles. Approximately 82,000 VHD per day are estimated as a result of congestion on the major network. Freeways and arterials are expected to carry the majority of vehicular traffic and the associated delays, counting approximately 76% to 78% of the estimated VMT, VHT, and VHD.

While VMT and VHT are expected to increase by an amount approximating expected population growth between 2005 and 2030 (i.e., around 25 percent and 30 percent, respectively), VHD is projected to increase at a substantially higher rate of nearly 44 percent. This is because much of the roadway system is currently operating at or over capacity for many hours of the day, and it only takes a small increase in additional traffic to create a large amount of additional congestion and delay under these conditions.

Table 5-1. Systemwide Daily Travel Statistics by Alternative

Alternative	Vehicle Miles Traveled	Vehicle Hours Traveled	Vehicle Hours of Delay
2005 Existing Conditions			
Existing Conditions	11,206,000	305,000	57,000
Alternative 1: 2030 No Build			
No Build Alternative	13,971,000	395,000	82,000
% Change from Existing Conditions	*25%*	*30%*	*44%*
Alternative 2: 2030 Transportation System Management			
TSM Alternative	13,874,000	390,000	80,000
% Change from No Build Alternative	*-0.7%*	*-1.3%*	*-2.4%*
Alternative 3: 2030 Managed Lane			
Two-direction Option	14,002,000	384,000	78,500
% Change from No Build Alternative	*0.2%*	*-2.8%*	*-4.3%*
Reversible Option	14,034,000	397,000	82,500
% Change from No Build Alternative	*0.5%*	*0.5%*	*0.6%*
Alternative 4: 2030 Fixed Guideway			
Kalaeloa – Salt Lake – North King – Hotel	13,464,000	365,000	65,000
% Change from No Build Alternative	*-3.6%*	*-7.6%*	*-21%*
Kamokila – Airport – Dillingham – King with a Waikīkī Branch	13,512,000	367,000	65,000
% Change from No Build Alternative	*-3.3%*	*-7.1%*	*-21%*
Kalaeloa – Airport – Dillingham – Halekauwila	13,500,000	367,000	67,000
% Change from No Build Alternative	*-3.4%*	*-7.1%*	*-18%*
20-mile Alignment East Kapolei to Ala Moana Center	13,539,000	376,000	73,500
% Change from No Build Alternative	*-3.1%*	*-4.8%*	*-11%*

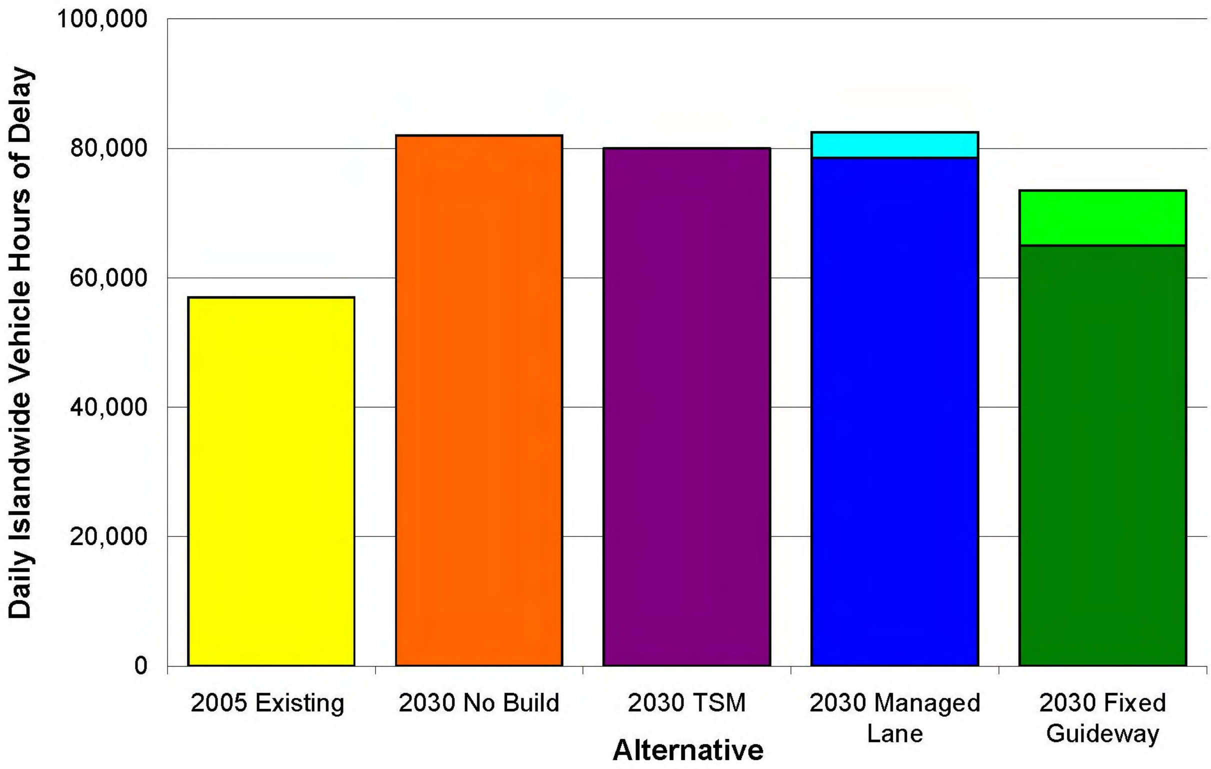
Alternative 2: Transportation System Management

The TSM Alternative is projected to have 13,874,000 VMT, 390,000 VHT, and 80,000 VHD per day. The TSM Alternative is expected to result in a minimal-to-slight decrease in the three systemwide travel measures by approximately one to two percent as compared to the No Build Alternative, indicating that it would have only a slight impact islandwide on how much people use their private automobiles and how much congestion is experienced.

Alternative 3: Managed Lane

Two-direction Option

The Two-direction Option is projected to have 14,002,000 VMT, 384,000 VHT, and 78,500 VHD. As compared to the No Build Alternative, this option would have a negligible impact on VMT. However, the option would have a slightly positive



The range between the maximum and minimum delay for each alternative depends on the option selected.

Figure 5-1. Islandwide Daily Vehicle Hours of Delay for All Alternatives

impact on VHT and VHD, which decrease by 2.8 percent and 4.3 percent, respectively, as a result of the faster speeds provided by the managed lane facility.

Reversible Option

The Reversible Option is projected to have 14,034,000 VMT, 397,000 VHT, and 82,500 VHD per day. As compared to the No Build Alternative, this option is projected to have a marginal increase in the three measures by less than one percent, indicating that it would encourage more people to drive private automobiles and would therefore also result in slightly more congestion on the roadway network.

Alternative 4: Fixed Guideway

The Fixed Guideway Alternative is projected to have the most significant impact of all the alternatives on these three travel measures (Table 5-1). Each of the fixed guideway combinations would attract more riders to transit—hence reducing how much people would use their private autos—and would also result in less congestion on the roadway system than any of the other alternatives.

Kalaeloa – Salt Lake – North King – Hotel Combination

The Kalaeloa – Salt Lake – North King – Hotel Combination alignment is projected to have the most significant effect of all three Fixed Guideway combination alignments on these three travel measures. With an estimated 13,464,000 VMT, 365,000 VHT, and 65,000 VHD per day, this full-length combination option would result in a 3.6 percent decrease in VMT, a 7.6 percent decrease in VHT, and a 21 percent decrease in VHD as compared to the No Build Alternative.

Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination

The Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination alignment is also projected to have a significant effect on these three travel measures. With an estimated 13,512,000 VMT, 367,000 VHT, and 65,000 VHD per day, this Full-corridor Alignment would result in a 3.3 percent decrease in VMT, a 7.1 percent decrease in VHT, and a 21 percent decrease in VHD as compared to the No Build Alternative. This combination would thus be just slightly less effective at reducing VMT, VHT, and VHD than would the Kalaeloa – Salt Lake – North King – Hotel Combination. This indicates that the Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination would attract a substantial number of riders to transit and result in less congestion on the roadway system than any of the non-fixed guideway options.

Kalaeloa – Airport – Dillingham – Halekauwila Combination

The Kalaeloa – Airport – Dillingham – Halekauwila Combination alignment is also projected to have a significant effect on these three travel measures. With an estimated 13,500,000 VMT, 367,000 VHT, and 67,000 VHD per day, this Full-corridor Alignment would result in a 3.4 percent decrease in VMT, a 7.1 percent decrease in VHT, and an 18 percent decrease in VHD as compared to the No Build alternative. These results are similar to those for the Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination.

20-mile Alignment

The 20-mile Alignment shows similar results as the Full-corridor Alignments, although to a lesser degree. With an estimated 13,539,000 VMT, 376,000 VHT, and 73,600 VHD per day, this option is projected to reduce VMT by 3.1 percent, VHT by 4.8 percent, and VHD by 11 percent in comparison to the No Build Alternative.

Daily Vehicle Trips

The following discusses the number of daily vehicle trips by alternative. This is an indicator of the amount of vehicle trips expected to be generated on the islandwide roadway network per day. The results of this analysis are presented in Table 5-2.

Under the 2030 No Build Alternative, approximately 1,978,800 daily vehicle trips are anticipated on the road network. In comparison, the TSM Alternative anticipates 1,970,800 daily trips on the network; this is less than a one-half-percent reduction from the No Build Alternative. This minor reduction is likely due to the enhanced transit system.

Table 5-2. Daily Islandwide Vehicle Trips

Time Period	2030 No Build Alternative	2030 TSM Alternative	Change from No Build	Managed Lane Two-direction Option	Change from No Build	Managed Lane Reversible Option	Change from No Build
AM Peak	514,681	511,803	-0.6%	506,737	-1.5%	506,899	-1.5%
Off Peak	843,533	840,839	-0.3%	840,948	-0.3%	841,192	-0.3%
PM Peak	620,569	618,108	-0.4%	614,796	-0.9%	615,229	-0.9%
Total Daily	1,978,783	1,970,750	-0.4%	1,962,481	-0.8%	1,963,320	-0.8%

Time Period	2030 No Build Alternative	Fixed Guideway Kalaeloa-Salt Lake-North King-Hotel	Change from No Build	Fixed Guideway Kamokila-Airport-Dillingham-King with a Waikiki Branch	Change from No Build	Fixed Guideway Kalaeloa-Airport-Dillingham-Halekauwila	Change from No Build
AM Peak	514,681	500,861	-2.7%	502,209	-2.4%	501,771	-2.5%
Off Peak	843,533	830,226	-1.6%	831,439	-1.4%	830,929	-1.5%
PM Peak	620,569	608,786	-1.9%	609,833	-1.7%	609,435	-1.8%
Total Daily	1,978,783	1,939,873	-2.0%	1,943,481	-1.8%	1,942,135	-1.9%

Time Period	2030 No Build Alternative	20-mile Alignment	Change from No Build
AM Peak	514,681	502,623	-2.3%
Off Peak	843,533	832,055	-1.4%
PM Peak	620,569	610,146	-1.7%
Total Daily	1,978,783	1,944,824	-1.7%

The Managed Lane Alternative would result in 1,962,500 and 1,963,300 vehicle trips for the Two-direction and Reversible Options, respectively. This is less than a one percent reduction as compared to the No Build Alternative.

For the three Full-corridor Alignment combinations for the Fixed Guideway Alternative, the anticipated number of vehicle trips range from 1,939,900 to 1,943,500. This is a noticeable reduction in vehicle trips (1.8% to 2.0%) when compared to the No Build Alternative. This reduction is likely due to the addition of the fixed guideway system to the transit system. The 20-mile Alignment yields a slightly smaller reduction in daily trips in comparison to the No Build Alternative. The projected number of daily islandwide vehicle trips is 1,944,800, or a 1.7% decrease.

Screenline Volumes and Levels-of-Service

As discussed in Chapter 2, Existing Transportation Conditions, five screenlines were identified to evaluate operating traffic conditions at selected locations within the corridor. Each screenline consists of two directions, inbound toward and outbound from the PUC. The average level-of-service across the screenline is reported and compared to the other alternatives. Table 5-3, Table 5-4, and Table 5-5 show year 2030 forecasted peak-hour screenline volumes and LOS for the No Build Alternative for five key screenlines within the corridor.

Alternative 1: No Build

As shown on Table 5-4, under the 2030 No Build Alternative, the most congested travel conditions during the a.m. peak hour are anticipated for Koko Head-bound traffic at the Kalauao Screenline (Screenline C). This congested travel condition applies to general purpose travel; the screenline is projected to operate at severely congested conditions of LOS F with an average V/C ratio of 1.54. In addition to this screenline, three other screenlines are projected to operate at an average of LOS E or LOS F in one or both directions during the a.m. peak hour.

The most congested individual general purpose facility is the H-1 Freeway at the Kalauao Screenline; the facility is projected to operate at LOS F with a V/C ratio of 1.90. The most congested individual HOV facility is the H-1 Freeway HOV at the Kalauao Screenline; the facility is projected to operate at LOS F with a V/C ratio of 1.59. Thirteen facilities are projected to operate at LOS E or LOS F during the a.m. peak hour.

As indicated in Table 5-5, during the p.m. peak hour, the most congested travel conditions are anticipated for ‘Ewa-bound traffic at the Kalauao Screenline with an average V/C ratio of 1.18 and a LOS F. This condition only applies to general purpose travel. In addition to this screenline, two additional screenlines operate at LOS E or LOS F in one or both directions.

Table 5-3. Selected Screenline Peak-Hour Volumes by Alternative

Alternative	Screenline Name									
	A. 'Ewa		B. Waikele		C. Kalauao		D. Kapālama Canal		E. Ward Avenue	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
2005 Existing Conditions										
'Ewa Bound	5,520	6,770	5,350	7,600	7,640	15,340	11,370	14,510	13,450	9,970
Koko Head Bound	6,770	5,320	7,940	6,340	18,870	8,970	15,040	12,660	13,430	12,120
Total	12,290	12,090	13,290	13,940	26,510	24,310	26,410	27,170	26,880	22,090
Alternative 1: 2030 No Build										
'Ewa Bound	9,100	10,690	7,680	10,910	9,580	20,270	13,390	16,130	13,000	11,470
% Change from Existing	65%	58%	44%	44%	25%	32%	18%	11%	*-3%*	*15%*
Koko Head Bound	12,170	9,041	16,930	10,170	28,020	11,470	18,190	14,540	12,950	14,150
% Change from Existing	80%	70%	113%	60%	48%	28%	21%	15%	*-4%*	*17%*
Total	21,270	19,731	24,610	21,080	37,600	31,740	31,580	30,670	25,950	25,620
% Change from Existing	73%	63%	85%	51%	42%	31%	20%	13%	*-3%*	*16%*
Alternative 2: 2030 Transportation System Management										
'Ewa Bound	8,970	10,530	7,660	11,080	9,530	20,090	13,340	16,030	12,990	11,340
% Change from No Build	-1%	-1%	0%	2%	-1%	-1%	*0%*	*-1%*	*0%*	*-1%*
Koko Head Bound	12,000	9,020	16,730	10,070	27,690	11,400	18,070	14,480	12,650	14,140
% Change from No Build	-1%	0%	-1%	-1%	-1%	-1%	*-1%*	*0%*	*-2%*	*0%*
Total	20,970	19,550	24,390	21,150	37,220	31,490	31,410	30,510	25,640	25,480
% Change from No Build	-1%	-1%	-1%	0%	-1%	-1%	*-1%*	*-1%*	*-1%*	*-1%*
Alternative 3: 2030 Managed Lane										
Two-direction Option										
'Ewa Bound	9,480	10,390	8,340	10,730	10,620	19,890	15,400	16,210	14,330	11,540
% Change from No Build	4%	-3%	9%	-2%	11%	-2%	*15%*	*0%*	*10%*	*1%*
Koko Head Bound	12,580	8,980	17,390	10,000	28,800	11,230	20,110	14,740	14,560	13,900
% Change from No Build	3%	-1%	3%	-2%	3%	-2%	*11%*	*1%*	*12%*	*-2%*
Total	22,060	19,370	25,730	20,730	39,420	31,120	35,510	30,950	28,890	25,440
% Change from No Build	4%	-2%	5%	-2%	5%	-2%	*12%*	*1%*	*11%*	*-1%*
Reversible Option										
'Ewa Bound	9,320	10,520	8,330	10,760	10,570	19,860	15,520	16,190	14,260	11,440
% Change from No Build	2%	-2%	8%	-1%	10%	-2%	*16%*	*0%*	*10%*	*0%*
Koko Head Bound	12,700	8,850	17,210	10,000	28,730	12,260	20,540	14,190	14,170	14,060
% Change from No Build	4%	-2%	2%	-2%	3%	7%	*13%*	*-2%*	*9%*	*-1%*
Total	22,020	19,370	25,540	20,760	39,300	32,120	36,060	30,380	28,430	25,500
% Change from No Build	4%	-2%	4%	-2%	5%	1%	*14%*	*-1%*	*10%*	*0%*

Alternative	Screenline Name									
	A. ‘Ewa		B. Waikele		C. Kalauao		D. Kapālama Canal		E. Ward Avenue	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
Alternative 4: 2030 Fixed Guideway										
Kalaeloa – Salt Lake – North King – Hotel										
‘Ewa Bound	8,490	9,890	7,700	10,460	9,090	18,930	13,040	15,320	12,890	10,980
% Change from No Build	-7%	-7%	0%	-4%	-5%	-7%	*-3%*	*-5%*	*-1%*	*-4%*
Koko Head Bound	10,990	8,740	15,390	9,800	25,810	10,970	16,860	14,080	11,970	13,920
% Change from No Build	-10%	-3%	-9%	-4%	-8%	-4%	*-7%*	*-3%*	*-8%*	*-2%*
Total	19,480	18,630	23,090	20,260	34,900	29,900	29,900	29,400	24,860	24,900
% Change from No Build	-8%	-6%	-6%	-4%	-7%	-6%	*-5%*	*-4%*	*-4%*	*-3%*
Kamokila – Airport – Dillingham – King with a Waikīkī Branch										
‘Ewa Bound	8,590	10,080	7,720	10,530	9,100	18,970	12,990	15,390	12,860	11,070
% Change from No Build	-6%	-6%	1%	-3%	-5%	-6%	*-3%*	*-5%*	*-1%*	*-3%*
Koko Head Bound	11,180	8,710	15,640	9,860	25,950	11,000	17,000	14,110	12,100	13,950
% Change from No Build	-8%	-4%	-8%	-3%	-7%	-4%	*-7%*	*-3%*	*-7%*	*-1%*
Total	19,770	18,790	23,360	20,390	35,050	29,970	29,990	29,500	24,960	25,020
% Change from No Build	-7%	-5%	-5%	-3%	-7%	-6%	*-5%*	*-4%*	*-4%*	*-2%*
Kalaeloa – Airport – Dillingham – Halekauwila										
‘Ewa Bound	8,550	9,990	7,700	10,520	9,090	18,960	12,980	15,500	12,930	11,190
% Change from No Build	-6%	-7%	0%	-4%	-5%	-6%	*-3%*	*-4%*	*-1%*	*-2%*
Koko Head Bound	11,060	8,740	15,640	9,860	25,930	10,990	17,000	14,040	12,070	13,940
% Change from No Build	-9%	-3%	-8%	-3%	-7%	-4%	*-7%*	*-3%*	*-7%*	*-1%*
Total	19,610	18,730	23,340	20,380	35,020	29,950	29,980	29,540	25,000	25,130
% Change from No Build	-8%	-5%	-5%	-3%	-7%	-6%	*-5%*	*-4%*	*-4%*	*-2%*
20-mile Alignment East Kapolei to Ala Moana Center										
‘Ewa Bound	8,580	10,250	7,750	10,690	9,100	19,090	12,960	15,280	12,840	11,030
% Change from No Build	-6%	-4%	1%	-2%	-5%	-6%	*-3%*	*-5%*	*-1%*	*-4%*
Koko Head Bound	11,470	8,720	15,800	9,880	26,100	11,000	17,070	14,170	12,270	13,940
% Change from No Build	-6%	-4%	-7%	-3%	-7%	-4%	*-6%*	*-3%*	*-5%*	*-1%*
Total	20,050	18,970	23,550	20,570	35,200	30,090	30,030	29,450	25,110	24,970
% Change from No Build	-6%	-4%	-4%	-2%	-6%	-5%	*-5%*	*-4%*	*-3%*	*-3%*

Table 5-4. A.M. Peak-Hour Screenline Volumes and Level-of-Service (LOS)

													2030 Managed Lane Alternative						2030 Fixed Guideway Alternative											
	Existing Conditions (2003)				2030	2030 No Build Alternative			2030 TSM Alternative				Two-direction Option			Reversible Option			Kalaeloa – Salt Lake – North King – Hotel			Kamokila – Airport – Dillingham – King with a Waikīkī Branch			Kalaeloa – Airport – Dillingham – Halekauwila			20-mile Alignment		
SCREENLINE / FACILITY	Facility Capacity (vph)	Observed Volume (vph)	Volume/ Capacity Ratio	Level-of-Service	Facility Capacity (vph)	Forecast Volume (vph)	Volume/ Capacity Ratio	Level-of-Service	Forecast Volume (vph)	Volume/ Capacity Ratio	Level-of-Service		Forecast Volume (vph)	Volume/ Capacity Ratio	Level-of-Service	Forecast Volume (vph)	Volume/ Capacity Ratio	Level-of-Service	Forecast Volume (vph)	Volume/ Capacity Ratio	Level-of-Service	Forecast Volume (vph)	Volume/ Capacity Ratio	Level-of-Service	Forecast Volume (vph)	Volume/ Capacity Ratio	Level – of-Service	Forecast Volume (vph)	Volume/ Capacity Ratio	Level-of-Service
A. ʻEwa Koko Head bound																														
H-1 Fwy	6,000	3,270	0.55	A	6,000	5,625	0.94	D	5,530	0.84	D		5,910	0.90	D	5,984	0.91	E	5,134	0.78	C	5,098	0.77	C	5,080	0.77	C	5,296	0.80	C
H-1 Fwy (Med HOV)	NA	NA	NA	NA	2,000	2,084	1.04	E	2,054	0.93	E		2,137	0.97	E	2,143	0.97	E	1,853	0.84	D	1,916	0.87	D	1,958	0.89	D	1,946	0.88	D
Farrington Hwy	1,700	580	0.34	A	2,550	2,711	1.06	F	2,689	1.05	F		2,708	0.72	C	2,740	1.07	F	2,301	0.90	D	2,442	0.96	E	2,282	0.89	D	2,505	0.98	E
Fort Weaver Rd (NB)	2,300	2,920	1.27	F	2,300	1,749	0.76	C	1,731	0.75	C		1,822	0.79	C	1,836	0.80	C	1,702	0.74	C	1,726	0.75	C	1,736	0.75	C	1,724	0.75	C
Total General Purpose Traffic	10,000	6,770	0.68	B	10,850	10,086	0.93	D	9,950	0.87	D		10,440	0.83	D	10,561	0.92	E	9,136	0.80	D	9,266	0.81	D	9,097	0.79	C	9,526	0.83	D
Total HOV Traffic	NA	NA	NA	NA	2,000	2,084	1.04	F	2,054	0.93	E		2,137	0.97	E	2,143	0.97	E	1,853	0.84	D	1,916	0.87	D	1,958	0.89	D	1,946	0.88	D
B. Waikele Stream Koko Head bound																														
H-1 Fwy	8,000	6,600	0.83	D	8,000	10,741	1.34	F	10,673	1.21	F		11,147	1.27	F	10,790	1.23	F	9,954	1.13	F	10,119	1.15	F	10,183	1.16	F	9,989	1.14	F
H-1 Fwy (Med HOV)	NA	NA	NA	NA	2,000	2,447	1.22	F	2,444	1.11	F		2,497	1.14	F	2,356	1.07	F	2,212	1.01	F	2,278	1.04	F	2,323	1.06	F	2,293	1.04	F
Waipahu St	750	270	0.36	A	750	643	0.86	D	619	0.83	D		651	0.87	D	786	1.05	F	467	0.62	B	504	0.67	B	500	0.67	B	596	0.79	C
Farrington Hwy	2,300	1,070	0.47	A	3,450	3,102	0.90	D	2,993	0.87	D		3,097	0.90	D	3,282	0.95	E	2,754	0.80	C	2,734	0.79	C	2,634	0.76	C	2,917	0.85	D
Total General Purpose Traffic	11,050	7,940	0.72	C	12,200	14,486	1.19	F	14,284	1.10	F		14,895	1.15	F	14,857	1.14	F	13,175	1.01	F	13,357	1.03	F	13,318	1.02	F	13,502	1.04	F
Total HOV Traffic	NA	NA	NA	NA	2,000	2,447	1.22	F	2,444	1.11	F		2,497	1.14	F	2,356	1.07	F	2,212	1.01	F	2,278	1.04	F	2,323	1.06	F	2,293	1.04	F
C. Kalauao Stream Koko Head bound																														
H-1 Fwy	9,500	10,960	1.15	F	9,500	18,049	1.90	F	17,897	1.88	F		18,327	1.93	F	18,419	1.94	F	17,322	1.82	F	17,414	1.83	F	17,198	1.81	F	17,209	1.81	F
H-1 Fwy (HOV[1]	1,900	1,600	0.84	D	1,900	3,014	1.59	F	2,959	1.56	F		2,882	1.52	F	2,769	1.46	F	2,756	1.45	F	2,701	1.42	F	2,898	1.53	F	2,740	1.44	F
H-1 Fwy (Zipper)[1]	1,900	1,700	0.89	D	1,900	2,444	1.29	F	2,398	1.26	F		1,677	0.88	D	NA	NA	NA	2,120	1.12	F	2,154	1.13	F	2,147	1.13	F	2,241	1.18	F
Moanalua Rd	1,700	1,650	0.97	E	1,700	1,018	0.60	B	1,006	0.59	A		918	0.54	A	966	0.57	A	722	0.42	A	756	0.44	A	709	0.42	A	853	0.50	A
Kamehameha Hwy	3,450	2,960	0.86	D	3,450	3,498	1.01	F	3,431	0.99	E		3,226	0.94	E	3,121	0.90	E	2,891	0.84	D	2,923	0.85	D	2,974	0.86	D	3,059	0.89	D
Managed Lane	NA	NA	NA	NA	2,200	NA	NA	NA	NA	NA	NA		1,769	0.80	D	3,457	0.79	C[2]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total General Purpose Traffic	14,650	15,570	1.06	F	14,650	22,565	1.54	F	22,334	1.38	F		22,471	1.39	F	22,507	1.39	F	20,936	1.30	F	21,093	1.31	F	20,881	1.29	F	21,120	1.31	F
Total HOV Traffic	3,800	3,300	0.87	D	3,800	5,458	1.44	F	5,357	1.41	F		4,559	1.20	F	2,769	1.46	F	4,876	1.28	F	4,855	1.28	F	5,045	1.33	F	4,980	1.31	F
Total Managed Lane Traffic	NA	NA	NA	NA	2,200	NA	NA	NA	NA	NA	NA		1,769	0.80	D	3,457	0.79	C[2]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D. Kapālama Canal Koko Head bound																														
Nimitz Hwy	2,700	3,670	1.36	F	2,700	4,723	1.75	F	4,824	1.79	F		4,939	1.83	F	4,353	1.61	F	4,348	1.61	F	4,410	1.63	F	4,488	1.66	F	4,463	1.65	F
Nimitz Flyover/Managed Lane	NA	NA	NA	NA	2,900	1,237	0.43	A	1,298	0.45	A		2,852	0.65	B[2]	3,900	0.89	D[2]	1,169	0.40	A	1,151	0.40	A	1,154	0.40	A	1,204	0.42	A
Dillingham Blvd	1,700	1,730	1.02	F	1,600	1,325	0.83	D	1,329	0.83	D		1,501	0.94	E	1,482	0.93	E	1,329	0.83	D	1,270	0.79	C	1,260	0.79	C	1,327	0.83	D
N King St	1,700	1,490	0.88	D	1,800	1,493	0.83	D	1,481	0.82	D		1,503	0.83	D	1,447	0.80	C	1,287	0.71	C	1,334	0.74	C	1,315	0.73	C	1,335	0.74	C
H-1 Fwy	6,800	6,860	1.01	F	7,600	8,008	1.05	F	7,717	1.02	F		7,879	1.04	F	8,000	1.05	F	7,500	0.99	E	7,578	1.00	E	7,509	0.99	E	7,420	0.98	E
School St	1,600	1,290	0.81	C	1,600	1,402	0.88	D	1,418	0.89	D		1,436	0.90	D	1,360	0.85	D	1,227	0.77	C	1,259	0.79	C	1,275	0.80	C	1,339	0.84	D
Total General Purpose Traffic	14,500	15,040	1.04	F	15,300	16,952	1.11	F	16,769	1.10	F		17,258	1.13	F	16,642	1.09	F	15,691	1.03	F	15,851	1.04	F	15,847	1.04	F	15,886	1.04	F
Total HOV Traffic	NA	NA	NA	NA	2,900	1,237	0.43	A	1,298	0.45	A		NA	NA	NA	NA	NA	NA	1,169	0.40	A	1,151	0.40	A	1,154	0.40	A	1,204	0.42	A
Total Managed Lane Traffic	NA	NA	NA	NA	4,400	NA	NA	NA	NA	NA	NA		2,852	0.65	B	3,900	0.89	D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E. Ward Avenue ʻEwa bound																														
H-1 Fwy	6,000	6,070	1.01	F	6,000	6,432	1.07	F	6,441	1.07	F		6,240	1.04	F	6,678	1.11	F	6,446	1.07	F	6,429	1.07	F	6,423	1.07	F	6,228	1.04	F
Beretania St	4,250	3,600	0.85	D	4,250	4,031	0.95	E	4,042	0.95	E		5,355	1.26	F	4,598	1.08	F	4,032	0.95	E	4,002	0.94	D	4,070	0.96	E	4,033	0.95	E
Kapiʻolani Blvd	3,200	2,100	0.66	B	3,200	2,540	0.79	C	2,504	0.78	C		2,737	0.86	D	2,982	0.93	E	2,411	0.75	C	2,432	0.76	C	2,441	0.76	C	2,578	0.81	D
Total	13,450	11,770	0.88	D	13,450	13,004	0.97	E	12,988	0.97	E		14,331	1.07	F	14,259	1.06	F	12,889	0.96	E	12,863	0.96	E	12,934	0.96	E	12,838	0.95	E
E. Ward Avenue Koko Head bound																														
H-1 Fwy	5,330	5,590	1.05	F	7,430	6,976	0.94	E	6,802	0.92	E		6,577	0.89	D	7,067	0.95	E	6,658	0.90	E	6,712	0.90	E	6,652	0.90	E	6,589	0.89	D
Kīnaʻu St	2,250	1,890	0.84	D	2,250	1,859	0.83	D	1,800	0.80	D		1,927	0.86	D	1,932	0.86	D	1,809	0.80	D	1,844	0.82	D	1,811	0.80	D	1,823	0.81	C
S King St	4,250	2,000	0.47	A	4,250	3,125	0.74	C	3,067	0.72	C		4,936	1.16	F	4,055	0.95	E	2,595	0.61	B	2,630	0.62	B	2,667	0.63	B	2,906	0.68	B
Kapiʻolani Blvd	1,600	800	0.50	A	1,600	985	0.62	B	976	0.61	B		1,117	0.70	C	1,115	0.70	C	912	0.57	A	908	0.57	A	936	0.58	A	952	0.60	B
Total	13,430	10,280	0.77	C	15,530	12,946	0.83	D	12,645	0.81	C		14,557	0.94	E	14,169	0.91	E	11,974	0.77	C	12,095	0.78	C	12,066	0.78	C	12,271	0.79	C

[1] Separate HOV lane and Zipper lane counts are not available at this location; hence HOV and Zipper lane traffic volumes are estimated at this location.
[2] Managed lane facility capacity estimated at 2,200 vehicles per lane per hour.

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Table 5-5. P.M. Peak-Hour Screenline Volumes and Level of Service (LOS)

												2030 Managed Lane Alternative						2030 Fixed Guideway Alternative											
	Existing Conditions (2003)				2030	2030 No Build Alternative			2030 TSM Alternative			Two-direction Option			Reversible Option			Kalaeloa – Salt Lake – North King – Hotel			Kamokila – Airport – Dillingham – King with a Waikīkī Branch			Kalaeloa – Airport – Dillingham – Halekauwila			20-mile Alignment		
SCREENLINE / FACILITY	Facility Capacity (vph)	Observed Volume (vph)	Volume/ Capacity Ratio	Level-of-Service	Facility Capacity (vph)	Forecast Volume (vph)	Volume/ Capacity Ratio	Level-of-Service	Forecast Volume (vph)	Volume/ Capacity Ratio	Level-of-Service	Forecast Volume (vph)	Volume/ Capacity Ratio	Level-of-Service	Forecast Volume (vph)	Volume/ Capacity Ratio	Level-of-Service	Forecast Volume (vph)	Volume/ Capacity Ratio	Level-of-Service	Forecast Volume (vph)	Volume/ Capacity Ratio	Level-of-Service	Forecast Volume (vph)	Volume/ Capacity Ratio	Level-of-Service	Forecast Volume (vph)	Volume/ Capacity Ratio	Level-of-Service
A. ʻEwa Waiʻanae bound																													
H-1 Fwy	6,600	3,440	0.57	A	6,600	4,590	0.70	B	4,513	0.68	B	4,473	0.68	B	4,575	0.69	B	4,337	0.66	B	4,276	0.65	B	4,260	0.65	B	4,359	0.66	B
H-1 Fwy (Med HOV)	NA	NA	NA	NA	2,200	1,641	0.75	C	1,645	0.75	C	1,573	0.72	C	1,604	0.73	C	1,463	0.67	B	1,547	0.70	B	1,556	0.71	C	1,629	0.74	C
Farrington Hwy	850	660	0.78	C	1,700	1,915	1.13	F	1,857	1.09	F	1,861	0.74	C	1,848	1.09	F	1,635	0.96	E	1,758	1.03	F	1,691	0.99	E	1,769	1.04	F
Fort Weaver Rd (NB)	2,300	2,670	1.16	F	2,300	2,544	1.11	F	2,510	1.09	F	2,479	1.08	F	2,492	1.08	F	2,456	1.07	F	2,496	1.09	F	2,485	1.08	F	2,490	1.08	F
Total General Purpose Traffic	9,150	6,770	0.74	C	10,600	9,050	0.85	D	8,880	0.84	D	8,814	0.77	C	8,915	0.84	D	8,428	0.80	D	8,529	0.80	D	8,436	0.80	C	8,619	0.81	D
Total HOV Traffic	NA	NA	NA	NA	2,200	1,641	0.75	C	1,645	0.75	C	1,573	0.72	C	1,604	0.73	C	1,463	0.67	C	1,547	0.70	C	1,556	0.71	C	1,629	0.74	C
B. Waikele Stream ʻEwa bound																													
H-1 Fwy	8,000	5,640	0.71	C	8,000	8,587	1.07	F	8,794	1.10	F	8,610	1.08	E	9,030	1.13	F	8,378	1.05	F	8,378	1.05	F	8,387	1.05	F	8,546	1.07	F
H-1 Fwy (Med HOV)	NA	NA	NA	NA	2,200	524	0.24	A	519	0.24	A	314	0.14	A	NA	NA	NA	470	0.21	A	487	0.22	A	486	0.22	A	494	0.22	A
Waipahu St	750	510	0.68	B	750	337	0.45	A	345	0.46	A	343	0.46	A	301	0.40	A	300	0.40	A	301	0.40	A	308	0.41	A	319	0.43	A
Farrington Hwy	3,450	1,450	0.42	A	4,600	1,463	0.32	A	1,422	0.31	A	1,461	0.32	A	1,433	0.31	A	1,309	0.28	A	1,368	0.30	A	1,339	0.29	A	1,333	0.29	A
Total General Purpose Traffic	12,200	7,600	0.62	B	13,350	10,387	0.78	C	10,561	0.79	C	10,414	0.78	D	10,764	0.81	D	9,986	0.75	C	10,047	0.75	C	10,034	0.75	C	10,198	0.76	C
Total HOV Traffic	NA	NA	NA	NA	2,200	524	0.24	A	519	0.24	A	314	0.14	A	NA	NA	NA	470	0.21	A	487	0.22	A	486	0.22	A	494	0.22	A
C. Kalauao ʻEwa bound																													
H-1 Fwy	9,500	9,220	0.97	E	9,500	12,445	1.31	F	12,288	1.29	F	12,278	1.29	F	12,274	1.29	F	11,820	1.24	F	11,713	1.23	F	11,797	1.24	F	11,802	1.24	F
H-1 Fwy (HOV) [1]	1,900	1,600	0.84	D	1,900	2,086	1.10	F	2,111	1.11	F	1,505	0.79	C	1,572	0.83	D	1,861	0.98	E	1,989	1.05	F	1,908	1.00	F	2,006	1.06	F
H-1 Fwy (Zipper) [1]	NA	NA	NA	NA	1,900	845	0.44	A	833	0.44	A	573	0.30	A	NA	NA	NA	779	0.41	A	790	0.42	A	797	0.42	A	778	0.41	A
Moanalua Rd	1,700	1,820	1.07	F	1,700	1,959	1.15	F	1,930	1.14	F	1,584	0.93	E	1,706	1.00	F	1,715	1.01	F	1,716	1.01	F	1,719	1.01	F	1,783	1.05	F
Kamehameha Hwy	3,450	2,700	0.78	C	3,450	2,933	0.85	D	2,923	0.85	D	2,712	0.79	C	2,750	0.80	D	2,753	0.80	D	2,762	0.80	D	2,735	0.79	C	2,722	0.79	C
Managed Lane	NA	NA	NA	NA	2,200	NA	NA	NA	NA	NA	NA	1,234	0.56	A	1,562	0.36	A[2]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total General Purpose Traffic	14,650	13,740	0.94	E	14,650	17,337	1.18	F	17,141	1.17	F	16,574	1.13	F	16,729	1.14	F	16,288	1.11	F	16,191	1.11	F	16,251	1.11	F	16,307	1.11	F
Total HOV Traffic	1,900	1,600	0.84	D	3,800	2,931	0.77	C	2,944	0.77	C	2,078	0.55	A	1,572	0.83	D	2,640	0.69	B	2,779	0.73	B	2,705	0.71	C	2,784	0.73	C
Total Managed Lane Traffic	NA	NA	NA	NA	2,200	NA	NA	NA	NA	NA	NA	1,234	0.56	A	1,562	0.36	A[2]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D. Kapālama Canal ʻEwa bound																													
Nimitz Hwy	2,700	3,400	1.26	F	2,700	3,115	1.15	F	3,128	1.16	F	3,058	1.13	F	2,402	0.89	E	2,836	1.05	F	2,893	1.07	F	2,858	1.06	F	2,914	1.08	F
Nimitz Flyover/Managed Lane	NA	NA	NA	NA	2,900	608	0.21	A	518	0.18	A	1,199	0.27	A[2]	2,041	0.46	A[2]	521	0.18	A	578	0.20	A	545	0.19	A	582	0.20	A
Dillingham Blvd	1,700	1,490	0.88	D	1,600	1,641	1.03	F	1,630	1.02	F	1,681	1.05	F	1,626	1.02	F	1,608	1.01	F	1,621	1.01	F	1,633	1.02	F	1,590	0.99	E
N King St	1,700	1,340	0.79	C	1,800	1,485	0.82	D	1,422	0.79	C	1,463	0.81	D	1,257	0.70	C	1,286	0.71	C	1,338	0.74	C	1,323	0.74	C	1,366	0.76	C
H-1 Fwy	7,200	7,520	1.04	F	7,200	8,394	1.17	F	8,451	1.17	F	8,055	1.12	F	8,066	1.12	F	8,248	1.15	F	8,130	1.13	F	8,298	1.15	F	7,954	1.10	F
School St	1,600	760	0.48	A	1,600	892	0.56	A	884	0.55	A	754	0.47	A	801	0.50	A	824	0.52	A	835	0.52	A	842	0.53	A	870	0.54	A
Total General Purpose Traffic	14,900	14,510	0.97	E	14,900	15,526	1.04	F	15,514	1.04	F	15,010	1.01	F	14,152	0.95	E	14,802	0.99	E	14,816	0.99	E	14,954	1.00	F	14,695	0.99	E
Total HOV Traffic	NA	NA	NA	NA	2,900	608	0.21	A	518	0.18	A	NA	NA	NA	NA	NA	NA	521	0.18	A	578	0.20	A	545	0.19	A	582	0.20	A
Total Managed Lane Traffic	NA	NA	NA	NA	4,400	NA	NA	NA	NA	NA	NA	1,199	0.27	A	2,041	0.46	A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E. Ward Avenue ʻEwa bound																													
H-1 Fwy	5,280	5,110	0.97	E	5,280	5,329	1.01	F	5,430	1.03	F	5,123	0.97	E	5,384	1.02	F	5,374	1.02	F	5,259	1.00	F	5,322	1.01	F	5,148	0.98	E
Beretania St	4,250	3,420	0.80	D	4,250	4,407	1.04	F	4,210	0.99	E	4,832	1.14	F	4,341	1.02	F	3,995	0.94	E	4,176	0.98	E	4,159	0.98	E	4,243	1.00	F
Kapiʻolani Blvd	1,600	1,440	0.90	E	1,600	1,732	1.08	F	1,701	1.06	F	1,583	0.99	E	1,716	1.07	F	1,614	1.01	F	1,630	1.02	F	1,708	1.07	F	1,638	1.02	F
Total	11,130	9,970	0.90	E	11,130	11,468	1.03	F	11,340	1.02	F	11,538	1.04	F	11,441	1.03	F	10,983	0.99	E	11,065	0.99	E	11,189	1.01	F	11,029	0.99	E
E. Ward Avenue Koko Head bound																													
H-1 Fwy	5,280	4,880	0.92	E	7,430	6,026	0.81	D	6,045	0.81	D	5,481	0.74	C	6,019	0.81	D	5,996	0.81	D	5,990	0.81	D	5,976	0.80	D	5,811	0.78	C
Kīnaʻu St	3,000	1,520	0.51	A	3,000	1,648	0.55	A	1,643	0.55	A	1,559	0.52	A	1,658	0.55	A	1,647	0.55	A	1,638	0.55	A	1,640	0.55	A	1,665	0.55	A
S King St	5,100	3,960	0.78	C	5,100	4,192	0.82	D	4,190	0.82	D	4,702	0.92	E	4,116	0.81	D	4,109	0.81	D	4,141	0.81	D	4,102	0.80	D	4,238	0.83	D
Kapiʻolani Blvd	3,200	1,760	0.55	A	3,200	2,286	0.71	C	2,264	0.71	C	2,158	0.67	B	2,264	0.71	C	2,167	0.68	B	2,182	0.68	B	2,220	0.69	B	2,225	0.70	C
Total	16,580	12,120	0.73	C	18,730	14,151	0.76	C	14,142	0.76	C	13,900	0.74	C	14,057	0.75	C	13,919	0.74	C	13,951	0.74	C	13,938	0.74	C	13,939	0.74	C

[1]Separate HOV lane and Zipper lane counts are not available at this location; hence HOV and Zipper lane traffic volumes are estimated at this location.
[2]Managed lane facility capacity estimated at 4,400 vph.

The most congested individual general purpose and HOV facilities are on the H-1 Freeway at the Kalauao Screenline. The general purpose and HOV lane both operate at LOS F with V/C ratios of 1.31 and 1.10, respectively. Twelve individual facilities are projected to operate at LOS E or LOS F during the p.m. peak hour.

Alternative 2: Transportation System Management

As shown in Table 5-3, the TSM Alternative results in a change ranging from a two percent decrease to a two percent increase in peak-hour volumes across the five corridor screenlines as compared to the No Build Alternative. Under the 2030 TSM Alternative, the most congested travel conditions during the a.m. peak hour are anticipated for Koko Head-bound traffic at the Kalauao Screenline (Screenline C) for general purpose travel (Table 5-4). The screenline is projected to operate at severely congested conditions of LOS F with an average V/C ratio of 1.38. In comparison to the No Build Alternative, this represents an improvement of 0.16 in the V/C ratio. Three additional screenlines also operate at LOS E or LOS F; this trend remains unchanged from the No Build Alternative.

The most congested individual general purpose facility is Koko Head-bound on Nimitz Highway at the Kapālama Canal Screenline; the facility is projected to operate at LOS F with a V/C ratio of 1.79. The most congested individual HOV facility is the H-1 Freeway HOV at the Kalauao Screenline; the facility is projected to operate at LOS F with a V/C ratio of 1.56. Under the TSM Alternative, 13 facilities are projected to operate at LOS E or LOS F – the same as with the 2030 No Build Alternative.

During the p.m. peak hour, the most congested travel conditions are anticipated for ‘Ewa-bound traffic at the Kalauao Screenline with an average V/C ratio of 1.17 at LOS F (Table 5-5). This condition only applies to general purpose travel. Comparing this screenline to the No Build Alternative, the V/C ratio is reduced by 0.01. Two additional screenlines are projected to operate at LOS E or LOS F. Compared to the No Build Alternative, there is no change in the number of screenlines at these operating conditions.

The most congested individual general purpose and HOV facilities are found on the H-1 Freeway at the Kalauao Screenline; the general purpose and HOV lanes both operate at LOS F with V/C ratios of 1.29 and 1.11, respectively. Twelve facilities operate at LOS E or LOS F. Compared with the 2030 No Build Alternative, this represents no change in the number of facilities at these operating conditions.

Alternative 3: Managed Lane

Two-direction Option

The two Managed Lane Alternative options are expected to increase the volume of peak-hour vehicles across each of the five corridor screenlines in the a.m. peak hour by two to 16 percent. In addition, they would have a minimal impact in reducing the volume in the p.m. peak hour (Table 5-3) as compared to the No Build Alternative.

With the Two-direction Option, the most congested travel conditions are projected to occur at the Kalauao Screenline in the Koko Head-direction. The general purpose travel facilities are projected to operate at LOS F with an average V/C ratio of 1.39. In comparison to the No Build Alternative, this is an improvement of 0.15 in the V/C ratio. Three additional screenlines are projected to operate at LOS E or LOS F, similar to that of the No Build Alternative.

The most congested individual general travel facility is on the H-1 Freeway on the Kalauao Screenline, which operates at LOS F with a V/C of 1.93. The most congested individual HOV facility is the H-1 Freeway HOV, also on the Kalauao Screenline, which operates at LOS F with a 1.52 V/C ratio. Under this alternative, 12 individual facilities are projected to operate at LOS E or LOS F. In comparison to the No Build Alternative, this represents a change of one less facility operating at congested conditions.

During the p.m. peak hour, the Kalauao Screenline in the ‘Ewa direction is projected to operate at a severely congested condition – LOS F with an average V/C ratio of 1.13. In comparison to the No Build Alternative, this represents an improvement in the V/C ratio by 0.05. Two additional screenlines are projected to operate at LOS E or LOS F, similar to the No Build Alternative.

The most congested individual facilities are on the H-1 Freeway. The general purpose lanes on the H-1 Freeway at the Kalauao Screenline operate with a V/C ratio of 1.29 and LOS F. The H-1 Freeway HOV facility on the Kalauao Screenline is projected to operate at LOS C with a V/C ratio of 0.79. The total number of individual facilities projected to operate at LOS E or LOS F is 11; this represents a change of one less facility operating at congested conditions compared to the No Build Alternative.

Reversible Option

With the Reversible Option, the most congested travel conditions are projected to occur at the Kalauao Screenline in the Koko Head direction. The general purpose travel facilities are projected to operate at LOS F with an average V/C ratio of 1.39. In comparison to the No Build Alternative, this is an improvement of 0.15 in the V/C ratio. Four additional screenlines are projected to operate at LOS E or LOS F, representing an increase of one screenline versus the No Build Alternative.

The most congested individual general travel facility is found on the H-1 Freeway on the Kalauao Screenline, which operates at LOS F with a V/C of 1.94. The most congested individual HOV facility is the H-1 Freeway HOV on the Kalauao Screenline, which operates at LOS F with a 1.46 V/C ratio. Under this alternative, 18 individual facilities are projected to operate at LOS E or LOS F. In comparison to the No Build Alternative, this represents an increase of five facilities operating at congested conditions.

During the p.m. peak hour, the Kalauao Screenline in the ‘Ewa direction is projected to operate at a severely congested condition – LOS F with an average V/C ratio of 1.14. In comparison to the No Build Alternative, this represents an improvement in the V/C ratio of 0.04. Two additional screenlines are projected to operate at LOS E or LOS F; compared to the No Build Alternative, the number of congested screenlines is reduced by one.

The most congested individual facilities are on the H-1 Freeway at the Kalauao Screenline. The general purpose facility operates at LOS F with a V/C ratio of 1.29; the HOV facility operates with a V/C ratio of 0.83 and LOS D. The total number of individual facilities projected to operate at LOS E or LOS F is 11; this represents a reduction by one facility at congested conditions compared to the No Build Alternative.

Alternative 4: Fixed Guideway

Table 5-3 shows that all of the Fixed Guideway Alternative alignments, including the 20-mile Alignment, are expected to reduce the number of vehicles crossing four of the five screenlines during peak hours by one to 10 percent as compared to the No Build Alternative. The one exception is the Waikele Screenline, which is expected to experience negligible change in the 'Ewa direction in the a.m. peak hour. This decrease in traffic volume is significant and would reduce V/C ratios and the degree of congestion. However, because of the very high volumes anticipated for the corridor, this reduction would not improve the overall screenline-level LOS during the a.m. peak hour. The number of individual facilities across the screenlines operating at LOS E or F during the a.m. peak hour would, however, decline. In the p.m. peak hour, overall screenline LOS is projected to improve from LOS F under the No Build Alternative to LOS E at the Kapālama Canal Screenline for three of the four Fixed Guideway alignments.

Kalaeloa – Salt Lake – North King – Hotel Combination

With the Kalaeloa – Salt Lake – North King – Hotel Combination, the most congested travel conditions are projected to occur at the Kalauao Screenline in the Koko Head direction. The general purpose travel facilities are projected to operate at LOS F with an average V/C ratio of 1.30. In comparison to the No Build Alternative, this is an improvement of 0.24 in the V/C ratio. Three additional screenlines are projected to operate at LOS E or LOS F, similar to that of the No Build Alternative.

The most congested individual general travel facility is the H-1 Freeway on the Kalauao Screenline, which operates at LOS F with a V/C ratio of 1.82. The most congested individual HOV facility is the H-1 Freeway HOV on the Kalauao Screenline, which operates at LOS F with a 1.45 V/C ratio. For this combination alignment, 10 individual facilities are projected to operate at LOS E or LOS F. In comparison to the No Build Alternative, this represents a change of three fewer facilities operating at congested conditions.

During the p.m. peak hour, the Kalauao Screenline in the 'Ewa direction is projected to operate at a severely congested condition – LOS F with an average V/C ratio of 1.11. In comparison to the No Build Alternative, this represents an improvement in the V/C ratio of 0.07. Two additional screenlines are projected to operate at LOS E or LOS F, similar to the No Build Alternative.

The most congested individual facilities are on the H-1 Freeway at the Kalauao Screenline. The general travel lane operates with a V/C ratio of 1.24 and LOS F; the H-1 Freeway HOV is projected to operate at LOS E with a V/C ratio of 0.98. The total number of individual facilities projected to operate at LOS E or LOS F is 12, representing no change compared to the No Build Alternative.

Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination

For the Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination, the most congested travel conditions are projected to occur at the Kalauao Screenline in the Koko Head direction. The general purpose travel facilities are projected to operate at LOS F with an average V/C ratio of 1.31. In comparison to the No Build Alternative, this is an improvement of 0.23 in the V/C ratio. Three additional screenlines are projected to operate at LOS E or LOS F; a trend similar to that found for the No Build Alternative.

The most congested individual general travel facility is the H-1 Freeway on the Kalauao Screenline, which operates at LOS F with a V/C ratio of 1.83. The most congested individual HOV facility is the H-1 Freeway HOV on the Kalauao Screenline, which operates at LOS F with a 1.42 V/C ratio. For this combination alignment, 10 individual facilities are projected to operate at LOS E or LOS F. In comparison to the No Build Alternative, this represents a change of three fewer facilities operating at congested conditions.

During the p.m. peak hour, the Kalauao Screenline in the ‘Ewa direction is projected to operate at a severely congested condition – LOS F with an average V/C ratio of 1.11. In comparison to the No Build Alternative, this represents an improvement in the V/C ratio of 0.07. Two additional screenlines are projected to operate at LOS E or LOS F; compared to the No Build Alternative, the number of congested screenlines remains unchanged.

The most congested individual facilities are on the H-1 Freeway at the Kalauao Screenline. The general travel lane operates with a V/C ratio of 1.23 and LOS F; the H-1 Freeway HOV is projected to operate at LOS E with a V/C ratio of 1.05. The total number of individual facilities projected to operate at LOS E or LOS F is 12, representing no change compared to the No Build Alternative.

Kalaeloa – Airport – Dillingham – Halekauwila Combination

With the Kalaeloa – Airport – Dillingham – Halekauwila Combination, the most congested travel conditions are projected to occur at the Kalauao Screenline in the Koko Head direction. The general purpose travel facilities are projected to operate at LOS F with an average V/C ratio of 1.29. In comparison to the No Build Alternative, this is an improvement of 0.25 in the V/C ratio. Three additional screenlines are projected to operate at LOS E or LOS F, similar to that of the No Build Alternative.

The most congested individual general travel facility is the H-1 Freeway on the Kalauao Screenline, which operates at LOS F with a V/C ratio of 1.81. The most congested individual HOV facility is the H-1 Freeway HOV on the Kalauao Screenline, which operates at LOS F with a 1.53 V/C ratio. For this combination alignment, 10 individual facilities are projected to operate at LOS E or LOS F. In comparison to the No Build

Alternative, this represents a change of three fewer facilities operating at congested conditions.

During the p.m. peak hour, the Kalauao Screenline in the ‘Ewa direction is projected to operate at a severely congested condition – LOS F with an average V/C ratio of 1.11. In comparison to the No Build Alternative, this represents an improvement in the V/C ratio of 0.07. Two additional screenlines are projected to operate at LOS E or LOS F; compared to the No Build Alternative, the number of congested screenlines remains unchanged.

The most congested individual facilities are on the H-1 Freeway at the Kalauao Screenline. The general travel lane operates with a V/C ratio of 1.24 and LOS F; the H-1 Freeway HOV is projected to operate at LOS E with a V/C ratio of 1.00. The total number of individual facilities projected to operate at LOS E or LOS F is 12, representing no change compared to the No Build Alternative.

20-mile Alignment

With the 20-mile Alignment, the most congested travel conditions are projected to occur at the Kalauao Screenline in the Koko Head direction. The general purpose travel facilities are projected to operate at LOS F with an average V/C ratio of 1.31. In comparison to the No Build Alternative, this is an improvement of 0.23 in the V/C ratio. Three additional screenlines are projected to operate at LOS E or LOS F, similar to that of the No Build Alternative.

The most congested individual general travel facility is found on the H-1 Freeway on the Kalauao Screenline, which operates at LOS F with a V/C ratio of 1.81. The most congested individual HOV facility is the H-1 Freeway HOV on the Kalauao Screenline, which operates at LOS F with a 1.44 V/C ratio. For the 20-mile Alignment, 10 individual facilities are projected to operate at LOS E or LOS F. In comparison to the No Build Alternative, this represents a change of three fewer facilities operating at congested conditions.

During the p.m. peak hour, the Kalauao Screenline in the ‘Ewa direction is projected to operate at a severely congested condition – LOS F with an average V/C ratio of 1.11. In comparison to the No Build Alternative, this represents an improvement in the V/C ratio of 0.07. Two additional screenlines are projected to operate at LOS E or LOS F; compared to the No Build Alternative, the number of congested screenlines is unchanged.

The most congested individual facilities are on the H-1 Freeway at the Kalauao Screenline. The general travel lane operates with a V/C ratio of 1.24 and LOS F; the H-1 Freeway HOV is projected to operate at LOS E with a V/C ratio of 1.06. The total number of individual facilities projected to operate at LOS E or LOS F is 12, representing no change compared to the No Build Alternative.

Chapter 6 Other Transportation Impacts

This chapter discusses potential impacts of the project alternatives on other elements of the transportation system. The chapter includes evaluations of issues such as physical impacts on roadways, impacts on parking and the non-motorized transportation system, freight movement, transit station access, and potential transportation system impacts during construction.

Physical Impacts on Roadway System

This section discusses anticipated physical impacts that the Fixed Guideway Alternative may have on the roadway system related to column placement and other physical effects of the fixed guideway facility. An in-depth discussion of potential physical effects on the roadway system for each section of the Fixed Guideway Alternative is provided in Appendix A. The roadway physical impact analysis is summarized below and in Table 6-1.

Fixed Guideway Section 1 – Kapolei to Fort Weaver Road

Four alignment options are proposed in Section 1, with each alignment beginning at the Kapolei Parkway/Hanua Street terminal and continuing in varying routes ending at Fort Weaver Road. Except for the alignments along Geiger Road and Fort Weaver Road, the other alignments would primarily travel though the future Kapolei development area and the future campus for UH West Oʻahu, where no significant obstacles or uses currently exist in the vicinity of the alignment. With the existing wide medians on Farrington Highway, Fort Weaver Road, and Kamokila Boulevard and anticipated wide medians on Kapolei Parkway and North-South Road, no impacts from column placement are expected. Column placements on Geiger Road would be in the median, but the roadway would be widened to avoid loss of a travel lane.

Fixed Guideway Section 2 – Fort Weaver Road to Aloha Stadium

Section 2 follows Farrington Highway to the H-1 Freeway, which it crosses and joins with Kamehameha Highway. The route then follows Kamehameha Highway to Aloha Stadium (the junction of Salt Lake Boulevard and Kamehameha Highway). With the existing wide median on Farrington Highway, impacts from column placement are expected to be minimal. However, closures of existing median openings on Kamehameha Highway may affect the left-turn access to cross streets or adjoining land uses.

Table 6-1. Summary of Physical Roadway Impacts for Fixed Guideway Alternative

Guideway Section	Roadway	From	To	Column Placement	Potential Column Impacts on Street
Section 1 Alignments					
Kamokila Blvd - Farrington Hwy	Kapolei Pkwy	Hanua St	Kamokila Blvd	Median	Should be none; wide median; future street
	Kamokila Blvd	Kapolei Pkwy	Fort Barrette Rd	Median	Should be none; wide median
	Farrington Hwy	Fort Barrette Rd	Kapolei GC Rd	Median	Minimal impacts
	Farrington Hwy	Kapolei GC Rd	Old Ft Weaver Rd	Makai of R/W	None (off street)
	Farrington Hwy	Old Ft Weaver Rd	Fort Weaver Rd	Mauka of R/W	None (off street)
Kapolei Pkwy - North-South Rd	Kapolei Pkwy	Kamokila Blvd	North-South Rd	Median	Should be none; wide median; future street
	North-South Rd	Kapolei Pkwy	Farrington Hwy	Median	Should be none; wide median; future street
Saratoga Ave - North-South Rd	Wākea St	Kapolei Pkwy	Saratoga Ave	Median	Should be none; wide median; future street
	Saratoga Ave	Wākea St	North-South Rd	Median	Should be none; wide median; future street
	North-South Rd	Saratoga Ave	Kapolei Pkwy	Median	Should be none; wide median; future street
Geiger Rd - Fort Weaver Rd	Geiger Rd	North-South Rd	Fort Weaver Rd	Median	Separate widening project along Geiger Road would create new median
	Fort Weaver Rd	Geiger Rd	Farrington Hwy	Median	Should be none; wide median
Section 2 Alignments					
Farrington Hwy - Kamehameha Hwy	Farrington Hwy	Fort Weaver Rd	Kamehameha Hwy	Median	Should be minimal; wide median
	Kamehameha Hwy	Farrington Hwy	Salt Lake Blvd	Median	Closures of existing median openings for column placement may affect left-turn access to cross streets or adjoining land uses, although attempts would be made to avoid this through strategic placement of columns
Section 3 Alignments					
Salt Lake Blvd - N King St	Salt Lake Blvd	Kamehameha Hwy	Puʻuloa Rd	Median	Bike lane impacts; may be new median which may impact access
	Pūkōloa St	Puʻuloa Rd	Ahua St	Makai-side curb lane	On-street parking impacts
	Moanalua Fwy	Ahua St	Middle St	Makai of R/W	None (off street)
Salt Lake Blvd - Dillingham Blvd	Moanalua Stream	Pūkōloa St	H-1 Fwy	Koko Head-side bank	None (off street)
Mauka of Airport Viaduct	Kamehameha Hwy	Salt Lake Blvd	H-1 Fwy	Median	Should be none; wide median
	H-1 Fwy	Kamehameha Hwy	Dillingham Blvd	Mauka of R/W	At-grade option has grade crossings at Camp Catlin and Catlin Drive
Makai of Airport Viaduct	H-1 Fwy	Kamehameha Hwy	Dillingham Blvd	Makai side of R/W	Should be none (off street)
Aolele St	Aolele St	H-1 Fwy	Dillingham Blvd	On sides of; not in street	None (off street)

Table 6-1. Summary of Physical Roadway Impacts for Fixed Guideway Alternative (continued)

Guideway Section	Roadway	From	To	Column Placement	Potential Column Impacts on Street
Section 4 Alignments					
Nimitz Hwy – N King St	Middle St	Nimitz Hwy	King St	On ʻEwa side of; not in street	None (off street)
Salt Lake Blvd - N King St	King St	Middle St	Kopke St	On makai side of street	On-street parking impacts
	King St	Kopke St	Liliha St	On mauka side of street	On-street parking impacts
Dillingham Blvd	Dillingham Blvd	Nimitz Hwy	Ka'aahi St	Median (future phase can look at column placement on side of road)	New median creates left-turn access problems; street not wide enough to allow U-turns (if columns can be moved to the side, left-turn access problems may be avoided)
Section 4 to Section 5 Connectors					
N King St - Beretania St				On private property	None (off street)
N King St - Hotel St	King St	Liliha St	Beretania St	Private property	None (off street)
	King St	Beretania St	Iwilei Rd	Median lane - loss of 1 lane	Loss of 1 inbound lane (however, traffic impacts may not be significant)
N King St - Nimitz Hwy	Ka'aahi St			On private property	None (off street)
Dillingham Blvd -Beretania St				On private property	None (off street)
Dillingham Blvd -Hotel St	Ka'aahi St	Dillingham Blvd	Private property	On mauka side of street On private property	On-street parking impacts to Ka'aahi St
	King St	Private property	Iwilei Rd	Median lane - loss of 1 lane	Loss of 1 inbound lane (however, traffic impacts may not be significant)
Dillingham Blvd -Nimitz Hwy				Private property	On-street parking impacts to Ka'aahi St
Dillingham Blvd-King St					None
King St – King St					None
Section 5 Alignments					
Beretania St – S King St	Beretania St	Liliha St	Alapa'i St	Underground	None
	King St	Alapa'i St	University Ave	Makai side of street	Parking loss; also loss of peak hour lane
King St - Waimanu Rd - Kapi'olani Blvd	King St/ Kapi'olani Blvd	River St	Dreier St	Tunnel	None
	Waimanu St	Ward Av	Kamake'e St	Mauka side of street	On-street parking impacts
	Kona St	KH of Kamake'e	Pi'ikoi St	Mauka side of street	On-street parking impacts

Table 6-1. Summary of Physical Roadway Impacts for Fixed Guideway Alternative (continued)

Guideway Section	Roadway	From	To	Column Placement	Potential Column Impacts on Street
(Continued) King St - Waimanu Rd - Kapi‘olani Blvd	Kona St	Pi‘ikoi St	Ke‘eaumoku St	Median	None
	Kona St	Ke‘eaumoku St	‘Ewa of Atkinson	Makai side of street	None
	Kapi‘olani Blvd	Atkinson Dr	University Ave	Median	Where median is new, would affect left-turn access and lose trees (options can be investigated to mitigate these impacts)
	University Ave	Kapi‘olani Blvd	King St	Median	On-street parking impacts and loss of bike lane
	University Ave	King St	Varsity Place	Median	New median would affect left-turn access
Hotel St - Kawaiaha‘o St - Kapi‘olani Blvd	Hotel St	River St	Alakea St	At-grade	Loss of bus lanes (because of transition from elevated to at-grade and conflict with fixed guideway operations)
	Hotel St	Alakea St	Richards St	Tunnel	Keep KH-bound auto lane
	Hotel St/Kawaiaha‘o St	Richards St	South St	Tunnel	None
	Kawaiaha‘o St	South St	Cooke St	Portal on mauka side of street	Blocks access to Curtis; On-street parking impacts
	Kawaiaha‘o St	Cooke St	‘Ewa of Kamake‘e St	Makai side of street	On-street parking impacts
Nimitz Hwy - Queen St - Kapi‘olani Blvd	Nimitz Hwy			Median	Minimal; wide median
	Queen St	Nimitz Hwy	Kamake‘e St	Makai side of street (could be in median if median being installed by HCDA Queen St improvement project)	Lose 1 of 2 ‘Ewa-bound lanes between Nimitz and Bishop; Parking impacts and would lose 1 lane in Kaka‘ako area
	Queen St	Kamake‘e St	Waimanu St	Median	Minimal; wide median
Nimitz Hwy - Halekauwila St - Kapi‘olani Blvd	Halekauwila St	Nimitz Hwy	‘Ewa of Ward Ave	Makai side of street	On-street parking impacts
Waikīkī Branch	Kalākaua Ave	Kapi‘olani Blvd	Kūhiō Ave	KH side of street	Loss of 1 ‘Ewa bound lane between Ala Wai Blvd and ‘Ena Rd
	Kūhiō Ave	Kalākaua Ave	‘Ōhua Ave	Mauka side of street	Taking ‘Ewa-bound lane (pockets may be created for parking and loading zones)

Fixed Guideway Section 3 – Aloha Stadium to Middle Street

Four alignment options are proposed in Section 3: Salt Lake Boulevard, Mauka of Airport Viaduct, Makai of Airport Viaduct, and Aolele Street. Each alignment begins at the junction of Salt Lake Boulevard/Kamehameha Highway and continues in varying routes ending in the vicinity of the Ke‘ehi Interchange/Middle Street. Because of the grade differences and constrained right-of-way on Salt Lake Boulevard, future column placement may affect future bike lane access along Salt Lake Boulevard. The alignments traveling in proximity to the Airport viaduct may be primarily off-street or on Airport property. As a result, they would have minimal physical impacts to the roadway system.

Fixed Guideway Section 4 – Middle Street to Iwilei

Two alignment options are proposed in Section 4: North King Street and Dillingham Boulevard. For the Dillingham Boulevard alignment, the column placement would require the addition of a new median, which would prevent left-turn access to driveways along Dillingham Boulevard. The existing width of Dillingham Boulevard is not adequate to readily permit u-turns which, in combination with the median, would force circuitous travel. Additional studies can analyze the positioning of columns on the side of the road so as to avoid the impacts of a median placement.

Fixed Guideway – Connectors for Section 4 and Section 5 in Iwilei

Eight combinations are possible for the connection between the various Section 4 and Section 5 alignments. Two connector alternatives would result in the loss of one Koko Head-bound lane on King Street near Iwilei Road: the connection between North King Street in Section 4 and Hotel Street in Section 5 and the connection between Dillingham Boulevard in Section 4 and Hotel Street in Section 5. The other connector alternatives would travel primarily off-street and result in minimal impacts from column placement.

Fixed Guideway Section 5 – Iwilei to UH Mānoa

The five proposed alignment options all begin at Iwilei and continue along varying routes to UH Mānoa. The Waikīkī Branch begins at Kapi‘olani Boulevard and ends at the Koko Head end of Waikīkī. In the Kaka‘ako area, the generally narrow roadway and the urbanized environment may result in loss of parking and/or travel lanes, as well as access impacts to adjoining properties along portions of Halekauwila Street, Kawaiaha‘o Street, Kona Street, Queen Street, or Waimanu Street. For the Hotel Street at-grade alternative, bus lanes accessing the Hotel Street transit mall may be eliminated. New median islands on portions of Kapi‘olani Boulevard and University Avenue may affect access to adjacent land uses. Bike lanes on University Avenue would be affected by placement of columns in the median.

Impacts on Parking

This section discusses anticipated effects of the project alternatives on the parking system, including impacts on the supply of on-street and off-street parking.

Alternative 1: No Build

As discussed in Chapter 3, Transportation Demand and Travel Patterns, and shown in Table 3-3, the 2030 No Build Alternative is projected to have a 27.5 percent increase in person trips by automobile relative to existing conditions, consistent with the projected increases in population and employment. This would result in an associated increased demand for parking at employment and activity centers and residential neighborhoods. The supply of parking would not be physically affected by the No Build Alternative.

Alternative 2: Transportation System Management

The TSM Alternative is projected to result in a decrease of less than one percent in the percentage of people traveling by automobile (from 79.5 to 79.2 percent mode share) relative to the No Build Alternative. This would result in a corresponding minor decrease in parking demand relative to the No Build Alternative. The following park-and-ride lots would be added to support the TSM Alternative:

- Kapolei Parkway/Hanua Street – 1,200 parking stalls
- UH West O‘ahu off of North-South Road – 1,700 parking stalls
- Ka Uka Road/H2 – 1,000 parking stalls
- Aloha Stadium – 1,300 parking stalls.

The park-and-ride lots would be located so as to intercept vehicles prior to the major choke points of the freeway system, such as the Waiawa Interchange of H-1 with H-2.

Alternative 3: Managed Lane

The Managed Lane Alternative is projected to result in a decrease of less than one percent in the percentage of people traveling by automobile (from 79.5 to 79.1 percent mode share) relative to the No Build Alternative. This would result in a corresponding minor decrease in parking demand relative to the No Build Alternative.

Provision of intermediate access ramps to the elevated managed lane facility in the vicinity of Aloha Stadium could affect the supply and/or configuration of parking serving Aloha Stadium. For the Managed Lane Alternative, park-and-ride lots would be located at the following sites:

- Kapolei Parkway/Hanua Street – 1,200 parking stalls
- UH West O‘ahu off of North-South Road – 1,700 parking stalls
- Ka Uka Road/H2 – 1,000 parking stalls
- Aloha Stadium – 1,300 parking stalls.

The park-and-ride lots would be located so as to intercept vehicles prior to the major choke points of the freeway system, such as the Waiawa Interchange of H-1 with H-2.

Alternative 4: Fixed Guideway

The three Full-corridor Alignment combinations are expected to result in transit mode shares of 7.6 to 7.7 percent and an increase in transit trips over the No Build Alternative by 55,700 to 62,000 daily trips, or 24 to 27 percent. The vast majority of these trips would be drawn from the highway mode as automobile travel is expected to decrease by 53,400 to 60,000 daily person trips. The 20-mile Alignment is expected to result in a transit mode share of 7.4 percent and an increase over the No Build Alternative of more than 46,000 transit trips and a decrease in automobile person tips by 44,600. Each alignment would result in corresponding decreases in parking demands.

Depending on the alignment selected, the Fixed Guideway combinations would have varying effects on existing on-street parking. On-street parking spaces would be removed in locations where the alignment requires placement of columns in the curb lane of streets or in medians with shifting of traffic lanes. These could include portions of Pūkōloa Street (Pu'uloa Road to Ahua Street) in Section 3, North King Street (Middle Street to Liliha Street) and Ka'aahi Street in Section 4, and South King Street (Alapa'i Street to University Avenue), Waimanu Street (Ward Avenue to Kamake'e Street), Kona Street, University Boulevard (Kapi'olani Boulevard to King Street), Kawaiaha'o Street (South Street to 'Ewa of Kamake'e Street), Queen Street ('Ewa of Kamake'e Street), Halekauwila Street (Nimitz Highway to 'Ewa of Ward Avenue) and Kūhiō Avenue ('Ewa of 'Ōhua Avenue) in Section 5.

Placement of columns for alignments passing through the Aloha Stadium parking lot could affect the supply and/or configuration of parking serving Aloha Stadium.

The tunnel transition from North King Street to Beretania Street, if such an alignment were selected, would require removal of an existing off-street parking lot serving a residential complex along the north side of Beretania Street east of Liliha Street. The transition from North King Street to Hotel Street, if this alignment were selected, would also affect a portion of the parking lot. Loss of this parking would have a significant impact on the parking supply serving the complex and the parking would need to be replaced.

Park-and-ride lots proposed to support the Fixed Guideway Alternative were shown in Table 4-1. Similar to the Managed Lane Alternative, the park-and-ride facilities would be located to provide an opportunity for leaving vehicles prior to reaching the major choke points of the freeway system.

Impacts on Non-Motorized Transportation System

This section discusses anticipated impacts that each of the alternatives may have on pedestrian and bicycle facilities and use. An in-depth discussion of potential impacts of each of the Fixed Guideway Alternative alignments on the pedestrian and bicycle systems is provided in Appendix B.

Alternative 1: No Build

As discussed in Chapter 3, Transportation Demand and Travel Patterns, and presented in Table 3-3, the No Build Alternative would result in a slight decrease in the percentage of people who walk and bike as a mode of transportation as compared to year 2005. The number of people who walk and bike increases substantially, but proportionally, there are a larger number of people who are using transit or private automobiles. Existing and planned bicycle and pedestrian facilities would not be significantly affected by the No Build Alternative.

Alternative 2: Transportation System Management

The TSM Alternative would result in a marginal decrease in the number of people who walk and bike as a mode of transportation, but the numbers remain essentially stable from the No Build Alternative. There is an improvement in transit usage, which could account for some of the change by those deciding to use transit rather than bike or walk. Existing and planned bicycle and pedestrian facilities would not be significantly affected by the TSM Alternative.

Alternative 3: Managed Lane

The Managed Lane Alternative would result in a marginal decrease in the number of people who walk and bike as a mode of transportation, but the numbers remain essentially stable from the No Build Alternative. There is an improvement in transit usage, which could account for some of the change by those deciding to use transit rather than bike or walk. The elevated managed lane facility would be constructed above Kamehameha Highway in the Pearl City/ʻAiea and Pearl Harbor areas and H-1in the airport area. It is expected to have minimal impact on pedestrian and bicycle facilities.

Alternative 4: Fixed Guideway

Each of the Fixed Guideway combination alignments would result in a small decrease in the percentage of people who walk and bike as a mode of transportation, but the numbers remain essentially stable from the No Build Alternative. The three combination alignments are expected to result in transit mode shares of 7.6 to 7.7 percent and an increase in transit trips over the No Build Alternative by 55,700 to 62,000 trips, or 24 to 27 percent. The vast majority of these trips are drawn from the highway mode.

Depending on the alignment, the Fixed Guideway combinations would have varying levels of effects on the pedestrian and bicycle systems. An in-depth evaluation of these effects by route alignment is provided in Appendix B.

Information regarding the existing and proposed bikeway system was obtained from *Bike Plan Hawaiʻi* (HDOT, 2003) and the *Honolulu Bicycle Master Plan* (April, 1999). Bike access to existing and future bike facilities would be affected in locations where the alignment requires placement of columns either in the bike lane or in the curb lane of a street resulting in inadequate clearance between bicyclists and vehicular traffic on a designated bike route. The bike facilities that could be affected by construction of the Fixed Guideway Alternative include a future bike path and signed bike route along

Farrington Highway in Section 1; a future bike lane on Salt Lake Boulevard from Kamehameha Highway to Ahua Street in Section 3; proposed bike facilities on Dillingham Boulevard, Waiakamilo Road, and Alakawa Street in Section 4; and an existing bike route on University Avenue and proposed bike facilities on Kapiʻolani Boulevard, Cooke Street, Queen Street, McCully Street, and Kalākaua Avenue in Section 5.

Construction of the alignments in Section 1 is not expected to significantly impact the pedestrian system given the relative low number of pedestrians in this area and the ability to integrate pedestrian-friendly design around the alignment with future development in this area. Construction of the alignments in Sections 2, 3, 4, and 5 where the alignment requires placement of columns in the median or off-street adjacent to the sidewalk, may result in an unappealing walking environment underneath the elevated structure, although column placement is not expected to interrupt pedestrian flow.

Impacts on Freight Movement

The alternatives under consideration for this project are primarily intended to improve movement of persons through the transportation system. The TSM, Managed Lane, and Fixed Guideway Alternatives all contain elements to increase the person-carrying capacity of the transit system. Although the Managed Lane Alternative would also permit high-occupancy vehicles and toll-paying single-occupant vehicles to use the managed lane facility, this would likely have only a limited direct effect on freight movement.

Thus, the effects of the various alternatives on freight movement are indirect, deriving from the reductions in delay and improvements in travel time on major highways that may accrue from implementation of the alternatives. The TSM Alternative is projected to result in minor improvements in travel time and reduction in delay relative to the No Build Alternative. The Managed Lane Alternative is projected to result in a moderate level of travel time and delay improvement, and the Fixed Guideway Alternative is projected to result in the highest level of improved travel time and reduced delay.

Access to Transit Stations

This section qualitatively assesses the relative convenience of access to proposed fixed guideway transit stations. It considers station location (urban, suburban), access modes, and the relative functionality of access facilities. This section discusses the level of access to proposed transit stations via the modes most appropriate for their location. Most of the stations would be elevated, except those planned along the at-grade Hotel Street alignment or the Beretania Street and King Street tunnel alignments. Although the location of stations varies among the alignments, the issues regarding access are similar. A detailed analysis of each of the proposed station locations is included in Appendix C of this report.

For the Fixed Guideway Alternative, the proposed stations in Section 1 would be located at major intersections in the vicinity of future Kapolei or Kalealoa development areas, the UH West Oʻahu campus, the Barbers Point NAS, and John Rogers Field. These stations would generally be well-connected to roads, with vehicular and transit access as the primary modes for the stations. Easy pedestrian and bike access are expected around the stations adjacent to UH West Oʻahu and residential neighborhoods along Geiger and Fort Weaver Roads. Feeder services between the planned stations and regional employment centers, campus destinations, or high-density residential neighborhoods may be considered. Stations that may be developed as intermodal transit centers include the Kapolei/Hanua terminal station and Kapolei/Wākea.

The planned stations in Section 2 would be located along Farrington Highway or Kamehameha Highway. With opportunities for substantial bus interface at the majority of the stations, as well as a major park-and-ride facility at the Pearl Highlands station, vehicular and transit access would be the primary modes of access for the stations. Pedestrian linkages should be provided between the Farrington/Mokuola station and the existing Waipahu transit center on Hikimoe Street and between the Kamehameha/ Kaonohi station and the proposed bus transit center near the Kamehameha/Kanuku intersection ʻEwa of the rail station.

In Section 3, all stations would be well-connected for vehicular access under all alignments. For the stations along Salt Lake Boulevard, an elevated concourse straddling Salt Lake Boulevard to convey pedestrians and bicyclists between the stations and the adjacent land uses may be needed. Circulator bus services are envisioned to connect proposed stations with the Arizona Memorial/Ford Island/Aloha Stadium area, the high-density Salt Lake residential community, Pearl Harbor, Hickam Air Force Base, and the Honolulu International Airport area. The Aolele/Airport station would be located on airport property with pedestrian and shuttle connections to the airport.

Because of the industrial-oriented environment in Section 4, poor pedestrian and bike access would be the major issues for stations along Middle Street and Dillingham Boulevard and stations near Kaʻaahi Street. The constrained right-of-way and the column placement may also affect transit ingress and egress in the stations and the left-turn access to adjoining properties.

In the vicinity of Downtown Honolulu, non-motorized access to many of the stations in Section 5 would be the primary focus. No kiss-and-ride facilities would be provided at these stations; however, major bus transfer provisions would be made at the Ala Moana Center station, the McCully Street station (for transfers to Waikīkī buses), and at University and Date Street (for transfers to/from buses serving east Honolulu). Pedestrian and vehicular access to stations in the Kakaʻako area may be limited by the constrained right-of-way and lack of continuous sidewalks on the streets along many of the alternative alignments in this area.

Transportation Impacts during Construction

Closures, disruptions, detours, maintenance of traffic, and temporary shuttle or other services to mitigate temporary lane closures are discussed in this section for each alternative.

Construction Methods

Alternative 1: No Build

No construction impacts would result from the No Build Alternative.

Alternative 2: Transportation System Management

The TSM Alternative would have relatively minor construction impacts along roadways and through traffic avenues. The two new transit centers in Pearl City and ‘Aiea are the only major construction efforts that are part of this alternative and they would have localized impacts in areas directly adjacent to transit center locations. Construction is estimated to take less than one year and would be performed during normal daytime hours. Traffic impacts are expected to be minimal and, therefore, construction would occur during the day to minimize construction costs.

Alternative 3: Managed Lane

The Managed Lane Alternative would have significant traffic impacts along Kamehameha Highway and Nimitz Highway during construction of the elevated roadway. Pre-cast methods of construction would be investigated in order to avoid some potential impacts. The pre-cast method allows segments of the roadway to be formed and poured in a central construction/staging area and then placed on the columns via crane operations at off-peak hours. At times during construction, one lane in each direction along Kamehameha Highway would be closed to traffic in the segment being constructed. Construction of the support columns would be cast-in-place. While some construction would be performed at night, the majority would likely occur during the daytime.

Alternative 4: Fixed Guideway

Construction of the Fixed Guideway Alternative would have significant traffic impacts along affected roadways during construction of the elevated guideway. Pre-cast methods of construction would be investigated in order to avoid some potential impacts. The pre-cast method allows segments of the roadway to be formed and poured in a central construction/staging area and then placed on the columns via crane operations at off-peak hours. At times during construction, one lane in each direction would be closed to traffic in the particular segment being constructed. Construction of the support columns would be cast-in-place.

Travel Affected by Construction

This section compares the relative roadway construction impacts of the Fixed Guideway and Managed Lane Alternatives. This measure is expressed in terms of daily VMT along the roadway network that would be affected by construction. A summary of this analysis is presented in Table 6-2.

Since there is no construction associated with the No Build Alternative, it would not affect vehicular travel. Construction of transit centers under the TSM Alternative would have localized impacts in areas directly adjacent to the transit center locations.

As shown in Table 6-2, the Kalaeloa – Salt Lake – North King – Hotel Combination Alignment of the Fixed Guideway Alternative would affect an estimated 576,000 daily vehicle miles traveled during construction. Approximately 631,000 daily VMT would be affected by construction of the Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination, and approximately 631,000 daily VMT by construction of the Kalaeloa – Airport – Dillingham – Halekauwila Combination. For the 20-mile Alignment, 524,100 daily VMT would be affected by construction. The differences between the combinations relate to the amount of traffic on streets along which the alignments would run. For example, the higher levels of VMT that would be affected by the Kamokila – Airport – Dillingham – King with a Waikīkī Branch Combination and the Kalaeloa – Airport – Dillingham – Halekauwila Combination result primarily from travel along Kapolei Parkway rather than Saratoga Avenue and a longer portion of Kamehameha Highway instead of Salt Lake Boulevard. The 20-mile Alignment results in less affected VMT since fewer street segments would be affected.

In comparison, construction of the two Managed Lane options would affect approximately 662,000 and 670,000 daily VMT, respectively. This is higher than the Fixed Guideway combinations primarily because of the impact of higher volumes of traffic on the H-1 and H-2 Freeways during construction of the connector ramps and the alignment of the Managed Lane Alternatives along high-volume facilities, such as Kamehameha Highway and Nimitz Highway.

Table 6-2. Daily Vehicle Miles Traveled Impacted by Construction

Alternative	Vehicle Miles Traveled on Streets Impacted by Construction
Alternative 1: 2030 No Build	
No Build Alternative	n/a
Alternative 2: 2030 Transportation System Management	
TSM Alternative	n/a
Alternative 3: 2030 Managed Lane	
Two-direction Option	662,000
Reversible Option	670,000
Alternative 4: 2030 Fixed Guideway	
Kalaeloa – Salt Lake – North King – Hotel	576,000
Kamokila – Airport – Dillingham – King with a Waikīkī Branch	631,000
Kalaeloa – Airport – Dillingham – Halekauwila	631,000
20-mile Alignment	524,000

Chapter 7 Summary

This chapter summarizes and compares the key transportation impact findings for each of the alternatives. Table 7-1 presents this quantitative and qualitative information for certain key measures. Based on this information, the key comparative assessment findings are as follows:

- Even with substantial transportation investments, neither the No Build nor the TSM Alternatives achieve significant congestion relief or reduction in daily hours of delay from existing conditions, although the TSM Alternative achieves some reduction in transit travel times compared to the No Build Alternative and existing conditions.
- Neither of the Managed Lane Alternative options offers significant transportation-related improvements compared to the 2030 No Build or TSM Alternatives, with the exception of some travel-time reliability improvements.
- In contrast, all of the Fixed Guideway options offer substantial travel-related benefits, including transit travel times that are generally faster that auto travel during peak hours (reflected in the major transit mode share increase for home-to-work trips), superior travel reliability, improved overall traffic flow (moderating the degree of congestion projected), and fewer construction-period traffic impacts than the Managed Lane options.
- The only alternative that is expected to significantly affect transit mode share and attract additional transit riders is the Fixed Guideway Alternative. Of the Fixed Guideway combinations, the Kalaeloa – Airport – Dillingham – Halekauwila alignment is projected to attract the highest systemwide transit ridership.
- In regards to serving existing and future transit markets, the Fixed Guideway Alternative does the best job in accommodating both longer corridor transit trips, as well as the increase in commute trips to West Oʻahu, which is expected to become much more pronounced in the future. Of the two Managed Lane options, the Two-direction Option best serves the increase in commute trips to West Oʻahu.
- The Fixed Guideway Alternative most consistently results in improved transit travel times between key corridor origins and destinations. In many cases these travel times are equivalent to, or faster than, the same trip time made by private auto under No Build conditions—especially when considering park-and-ride trips. The Fixed Guideway Alternative also is expected to produce the most reliable travel times because the guideway would be in its own right-of-way separate from roadways and associated congestion.
- The Managed Lane options provide some travel-time improvements for selected origins and destinations well served by the facility, but in most cases the travel time savings experienced on the facility itself is offset by the increased congestion experienced accessing and egressing the facility.
- Traffic congestion on key corridor facilities is expected to continue to exist under all alternatives, particularly during the peak travel periods. However, systemwide vehicle hours of delay are projected to be significantly lower for the Fixed Guideway Alternative as compared to all other alternatives.

- The Managed Lane Alternative may reduce congestion somewhat along the managed lane facility itself, but it creates additional congestion on roadways leading up to and away from it because of the volume of traffic attempting to access it; hence, very little positive change in systemwide vehicle hours of delay is projected.
- While all other alternatives have a minimal to negligible positive impact on peak-period traffic volumes in the corridor (in fact the Managed Lane options are expected to increase vehicle peak-hour volumes in the corridor by up to 16 percent across key screenlines), the Fixed Guideway Alternative is projected to reduce peak direction traffic volumes by three to seven percent across the Kapālama Canal, and by up to 10 percent at the ʻEwa Screenline. Most importantly, however, the Fixed Guideway Alternative provides a mobility option that the other alternatives do not, in that it gives users the opportunity to bypass the congestion that is projected to occur on roadways throughout the study corridor.

Table 7-1. Summary Transportation Impacts Results Matrix

Alternative	Evaluation Measures												
	Transit Service Impacts						Other Transportation Impacts						
			Transit Mode Share (%)						Roadway Impacts			Non-Motorized Travel Impacts	
	Transit Travel Times (minutes) [a]	Auto vs. Transit Travel Times	Total Daily	Home-Work	Daily Transit Boardings	Travel Reliability (% Exclusive ROW)	Daily Vehicle Miles Traveled (millions)	Daily Vehicle Hours of Delay	Construction VMT [b]	Traffic Flow [c]	Parking Impacts	Bicycles	Pedestrian
2005 Existing Conditions													
Existing Conditions	56	auto faster	5.9%	10.9%	236,600	0%	11.2	57,000	N/A	8 (8)	N/A	N/A	N/A
Alternative 1: 2030 No Build													
No Build Alternative	57.7	auto faster	6.1%	11.2%	330,600	0%	14.0	82,000	N/A	13 (12)	Increased demand	N/A	N/A
Alternative 2: 2030 Transportation System Management													
TSM Alternative	52.8	auto faster	6.4%	12.1%	354,200	0%	13.9	80,000	N/A	13 (12)	Minor demand decrease	N/A	N/A
Alternative 3: 2030 Managed Lane													
Two-direction Option	53.5	auto faster	6.5%	12.6%	363,700	Ranges from 52 to 61%	14.0	78,500	662,000	12 (11)	Minor demand decrease	Minimal	Minimal
Reversible Option	55.3	auto faster	6.4%	12.3%	363,700		14.0	82,500	670,000	18 (11)	Minor demand decrease	Minimal	Minimal
Alternative 4: 2030 Fixed Guideway				.									
Kalaeloa - Salt Lake- North King - Hotel	43.6	transit faster	7.7%	16.2%	468,800	Ranges from 93 to 99%	13.5	65,000	576,000	10 (12)	Decreased demand and minor supply decrease	Potential auto-cyclist impacts in congested areas with constrained ROW due to guideway column placement	Minimal
Kamokila - Airport - Dillingham - King with a Waikīkī Branch	43.1	transit faster	7.6%	15.7%	449,300		13.5	65,000	631,000	10 (12)			
Kalaeloa - Airport - Dillingham - Halekauwila	47.0	transit faster	7.7%	16.2%	468,300		13.5	67,000	631,000	10 (12)			
20-mile Alignment	47.3	transit faster	7.4%	15.2%	455,300		13.5	73,500	524,000	10 (12)			

[a] - Average trip time in minutes from 10 origins and destinations (assumes walk-to-transit)
[b] - Daily VMT on construction-impacted streets
[c] - Total AM (PM) congested facilities (LOS E or F) in peak direction on five measured screenlines (‘Ewa, Waikele Stream, Kalauao, Kapālama Canal, Ward Avenue)

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Appendix A Transportation Impact Analysis

Potential transportation impacts resulting from the Fixed Guideway Alternative are evaluated in this appendix. The discussion is focused on column placement and physical layout of the guideway sections. As described below, there are five sections of the Fixed Guideway Alternative; within each section are several alignment options. This discussion is organized by section.

For the purposes of this discussion, column impacts are evaluated assuming that columns would generally be 6 feet wide on a 120-foot spacing. Allowing for 2 feet clear on either side, columns would thus require a 10-foot-wide footprint when in the street.

Table A-1. Fixed Guideway Alternative Analysis Sections and Alignments

Section	Alignments Being Considered	Number of Stations
I. Kapolei to Fort Weaver Road	Kamokila Boulevard/Farrington Highway	5
	Kapolei Parkway/North-South Road	6
	Saratoga Avenue/North-South Road	8
	Geiger Road/Fort Weaver Road	7
II. Fort Weaver Road to Aloha Stadium	Farrington Highway/Kamehameha Highway	5
III. Aloha Stadium to Middle Street	Salt Lake Boulevard	2
	Mauka of the Airport Viaduct	3
	Makai of the Airport Viaduct	4
	Aolele Street	4
IV. Middle Street to Iwilei	North King Street	2
	Dillingham Boulevard	3
V. Iwilei to UH Mānoa	Beretania Street/South King Street	8
	Hotel Street/Kawaiaha'o Street/Kapi'olani Boulevard	12
	King Street/Waimanu Street/Kapi'olani Boulevard	9
	Nimitz Highway/Queen Street/Kapi'olani Boulevard	10
	Nimitz Highway/Halekauwila Street/ Kapi'olani Boulevard	10
	Waikīkī Branch	3

Section 1: Kapolei to Fort Weaver Road

Four alignment options are proposed in Section 1: Kamokila Boulevard/Farrington Highway; Kapolei Parkway/North-South Road; Saratoga Avenue/North-South Road; and Geiger Road/Fort Weaver Road. Each alignment begins at the Kapolei Parkway and Hanua Street terminal station and continues in varying routes ending at Fort Weaver Road.

Alignment: Kamokila Boulevard/Farrington Highway

This alignment is approximately 6.1 miles long and generally follows Kapolei Parkway (future street) to Kamokila Boulevard to Farrington Highway and ends at Fort Weaver Road. Five station locations are proposed along this alignment. The following describes the potential impacts along this alignment option:

- The future Kapolei Parkway from Hanua Street to Kamokila Boulevard is expected to have a 44-foot-wide median. There would be sufficient space to accommodate columns in the median; no impacts from column placement are anticipated.
- The existing section of Kamokila Boulevard from Kapolei Parkway to Farrington Highway has a 20-foot-wide median. There would be adequate space to accommodate columns in the median. No impacts from column placement are anticipated.
- The section of Farrington Highway from Kamokila Boulevard to Fort Barrette Road has a 20-foot-wide median. There would be an adequate amount of space to accommodate columns in the median. No impacts from column placement are anticipated.
- The section of Farrington Highway from Fort Barrette to Kapolei Golf Course Road has a 20-foot-wide median. Impacts from column placement are anticipated to be minimal.
- Along Farrington Highway from Kapolei Golf Course Road to Old Weaver Road, the alignment would be located on the makai side of the roadway. No impacts from column placement are anticipated.
- Along Farrington Highway from Old Fort Weaver Road to Fort Weaver Road, the alignment would be located on the mauka side of the roadway. No impacts from column placement are anticipated.

Alignment: Kapolei Parkway/North-South Road

This alignment is approximately 7.2 miles long and generally travels along Kapolei Parkway (future street) to North-South Road (future street) to Farrington Highway and ending at Fort Weaver Road. Six station locations are proposed along this alignment. The following describes the potential impacts along this alignment option:

- The future Kapolei Parkway from Kamokila Boulevard to North-South Road is expected to have a 44-foot-wide median. There would be sufficient space to accommodate columns in the median. No impacts from column placement are anticipated.
- The future North-South Road from Kapolei Parkway to Farrington Highway is expected to have a 28-foot-wide median. There would be adequate space to accommodate columns in the median; no impacts from column placement are anticipated.

Alignment: Saratoga Avenue/North-South Road

This alignment is approximately 9.0 miles long and generally travels from the Kapolei terminus to Wākea Street (future street) to Saratoga Avenue (future street) to North-South Road (future street) to Farrington Highway and ending at Fort Weaver Road. Eight stations are planned along this alignment. The following describes the potential impacts along this alignment option:

- The future Wākea Street from Kapolei Parkway to Saratoga Avenue is expected to have a 14-foot-wide median. There would be adequate space in the median for columns.
- The future Saratoga Avenue from Wākea Street to North-South Road is expected to have a wide median. There would be adequate space to accommodate columns in the median; no impacts from column placement are anticipated.
- The future North-South Road from Kapolei Parkway to Farrington Highway is expected to have a 28-foot-wide median. There would be adequate space to accommodate columns in the median; no impacts from column placement are anticipated.

<u>Alignment: Geiger Road/Fort Weaver Road</u>

This alignment is approximately 8.9 miles long and generally travels from the Kapolei terminus to Wākea Street to Saratoga Avenue to Geiger Road to Fort Weaver Road and ends at Farrington Highway. Seven station locations are proposed along this alignment. The following describes the potential impacts along this alignment option:

- A new median would be constructed along Geiger Road to accommodate columns. Geiger Road would need to be widened to create the new median.
- The section of Fort Weaver Road from Geiger Road to Farrington Highway has a median width of 32 to 34 feet. A separate widening project along Fort Weaver Road could narrow the median slightly, but it is expected that there would be sufficient room for columns in the median.

Section 2: Fort Weaver Road to Aloha Stadium

Only one alignment option is proposed in Section 2. The alignment travels from the Farrington Highway and Leokū Street station to the vicinity of Aloha Stadium. The alignment follows Farrington Highway to the H-1 Freeway, which it crosses and joins with Kamehameha Highway; the route then follows Kamehameha Highway to Aloha Stadium (the junction of Salt Lake Boulevard and Kamehameha Highway).

<u>Alignment: Farrington Highway/Kamehameha Highway</u>

This alignment is approximately 6.7 miles long and travels from the Farrington Highway and Leokū Street station to the vicinity of Aloha Stadium. Five station locations are proposed along this alignment. The following describes the potential impacts along this alignment option:

- Columns would be placed in the existing median in the section of Farrington Highway from Fort Weaver Road to Kamehameha Highway. This is expected to have minimal impacts because of the existing wide median.
- Columns would be placed in the existing median in the section of Kamehameha Highway from Farrington Highway to Salt Lake Boulevard. This may involve the restriping or reconstruction of the left-turn lanes affected by the modifications necessary for the medians. Closures of existing median openings necessitated by column placements may affect left-turn access to cross streets or adjacent land uses, although attempts would be made to minimize or avoid this through strategic placement of columns.

In addition, one of the proposed fixed guideway stations for this section may be located at the intersection of Kamehameha Highway and Kaonohi Street ‘Ewa of the Pearlridge Center. Because of station construction, this intersection may require widening and could involve restriping or reconstruction of the left-turn lanes affected by the modifications necessary for column placement.

Section 3: Aloha Stadium to Middle Street

Four alignment options are proposed in Section 3: Salt Lake Boulevard; Mauka of Airport Viaduct; Makai of Airport Viaduct; and Aolele Street. Each alignment begins at the junction of Salt Lake Boulevard/Kamehameha Highway and continues in varying routes ending in the vicinity of the Kalihi Interchange/Middle Street.

Alignment: Salt Lake Boulevard

This alignment is approximately 4.8 miles long and generally travels from Aloha Stadium along Salt Lake Boulevard to Pūkōloa Street, runs adjacent to the Moanalua Freeway, and ends at Middle Street. An alternative alignment travels from Pululoa Street along the Koko Head side of Moanalua Stream and ends at the Ke‘ehi Interchange. Two station locations are proposed along this alignment. The following describes the potential impacts along this alignment option:

- The section along Salt Lake Boulevard from Kamehameha Highway to Pu‘uloa Road may have issues with column placement on the median because of the grade difference between the two sides of the roadway. A new median would be constructed on portions of Salt Lake Boulevard without a median. The new median could affect access and future bike lanes.
- Along Pūkōloa Street from Pu‘uloa Road to Ahua Street, columns would be placed along the makai side curb lane. This would impact on-street parking in the area.
- No impacts are expected along the section of the Moanalua Freeway from Ahua Street to Middle Street. The column placement would be off-street and makai of the right-of-way.
- No impacts are expected along the Koko Head side of Moanalua Stream. The column placement would be off-street and Koko Head of the stream.

Alignment: Mauka of the Airport Viaduct

This alignment is approximately 5.1 miles long and generally travels from Aloha Stadium along Kamehameha Highway to the H-1 Freeway, which it crosses and continues mauka of the Airport Viaduct to the Ke‘ehi Interchange. Three stations are proposed along this alignment. The following describes the potential impacts along this alignment option:

- A wide median would be constructed in portions of Kamehameha Highway from Salt Lake Boulevard to the H-1 Freeway where narrow medians exist. No impacts are anticipated as a result of column placement in the median.
- There are two options for the portion of the alignment mauka of the H-1 Freeway from Kamehameha Highway to Dillingham Boulevard: at-grade and elevated. Columns for the elevated option would be off-street. For the at-grade option, new grade crossings would be created at Camp Catlin Road and Catlin Drive.

Alignment: Makai of the Airport Viaduct

This alignment is approximately 5.2 miles long and generally travels from Aloha Stadium along Kamehameha Highway to the H-1 Freeway and continues along Nimitz Highway, makai of the Airport Viaduct, to the Ke'ehi Interchange. Four station locations are proposed along this alignment. The following describes the potential impacts along this alignment option:

- A wide median would be constructed in portions of Kamehameha Highway from Salt Lake Boulevard to the H-1 Freeway where narrow medians exist. No impacts are anticipated as a result of column placement in the median.
- Columns for the portion of the alignment makai of the H-1 Freeway from Kamehameha Highway to Dillingham Boulevard would be off-street.

Alignment: Aolele Street

This alignment is approximately 5.4 miles long and generally travels from Aloha Stadium along Kamehameha Highway to the H-1 Freeway and continues along makai of the Airport Viaduct to Aolele Street, turning toward the Airport along Aolele Street and continuing to Dillingham Boulevard via Lagoon Drive. Four station locations are proposed along this alignment. The following describes the potential impacts along this alignment option:

- A wide median would be constructed in portions of Kamehameha Highway from Salt Lake Boulevard to the H-1 Freeway where narrow medians exist. No impacts are anticipated as a result of column placement in the median.
- The section of Aolele Street from the H-1 Freeway to Dillingham Boulevard is not expected to be affected, as column placement would occur along the sides of, but not in, the street.

Section 4: Middle Street to Iwilei

Two alignment options are proposed in Section 4: North King Street and Dillingham Boulevard.

Alignment: North King Street

This alignment is approximately 2.3 miles long and generally travels from the Ke'ehi Interchange through the Middle Street Transit Center, along Middle Street and continues Koko Head along North King Street to Liliha Street. Three station locations are proposed along this alignment. The following describes the potential impacts along this alignment option:

- Column placement would be off-street and on the 'Ewa side along the section of Middle Street from Nimitz Highway to King Street. Impacts are not expected from column placement.
- Along North King Street, the column placements would be on the makai side of the street between Middle Street and Kopke Street and on the mauka side of the street between Kopke Street and Liliha Street. This would result in the loss of on-street parking spaces

in the vicinity of the columns. In portions along North King Street, the roadway would be restriped to provide space for the columns.

Alignment: Dillingham Boulevard

This alignment is approximately 1.8 miles long and generally travels from the Ke‘ehi Interchange to Iwilei via Dillingham Boulevard. Three station locations are proposed along this alignment. The following describes the potential impacts along this alignment option:

- Several impacts are expected along the section of Dillingham Boulevard from Nimitz Highway to Ka‘aahi Street. The column placements would require the addition of a new median, which would prevent left-turn access to and from driveways along Dillingham Boulevard. The existing width of Dillingham Boulevard is not adequate to readily permit u-turns which, in combination with the median, would force motorists attempting to access adjacent land uses to travel out of their way in circuitous paths. The circuitous travel would be further aggravated by the lack of a full street grid in the area, making it difficult to travel around the block. The most affected section of this alignment would be the makai side of Dillingham Boulevard between Kōkea Street and Ka‘aahi Street. Further studies can analyze the placement of columns on the side of the road so as to avoid the impacts of a median placement.

Section 4 to Section 5 Connections

Eight combinations are possible for the connections between the Section 4 and Section 5 alignments. A fixed guideway station located between Pua Lane and Iwilei Road would be built for the selected connection. Four locations are considered for the station depending on the connection alternatives. The connector alignments are part of Section 5 but are described below:

Alignment: North King Street – Beretania Street

This alignment connects North King Street to Beretania Street and has a station located on the ‘Ewa side of the King Street/Liliha Street intersection. Column placement would be off-street and on private property. On-street impacts from the column placement are expected to be minimal.

Alignment: North King Street – Hotel Street

This alignment connects North King Street to Hotel Street. The station along this connection would be the same as for the North King Street – Beretania connection. Column placement would be off-street and on private property between Liliha Street and Beretania Street. Between Beretania Street and Hotel Street, the column placement would result in the loss of one Koko Head-bound lane (reducing the number of Koko Head-bound lanes in this section from four to three). However, this is not expected to significantly impact traffic flow since the existing four-lane section is short and is fed by only three upstream lanes.

Alignment: North King Street – Nimitz Highway

This alignment travels from the North King Street/Liliha Street intersection through private property makai of North King Street before it connects to Nimitz Highway. A station would be located on private property on the makai side of King Street near Liliha Street.

Alignment: North King Street – King Street Tunnel

This alignment follows a similar alignment and has the same station location as the North King Street – Nimitz Highway alignment between Liliha Street and Iwilei Road. On the Koko Head side of Iwilei Road, the alignment is underground and connects to King Street by going under Nuʻuanu Stream and private properties makai of King Street.

Alignment: Dillingham Boulevard – Beretania Street

This alignment travels from Dillingham Boulevard/Akepo Lane through private property in the industrial area before it connects to Beretania Street. The transit station for this connection would be located on private property near the intersection of King Street and Iwilei Road in the industrial area.

Alignment: Dillingham Boulevard – Hotel Street

This alignment travels from Dillingham Boulevard/Akepo Lane through private property in the industrial area before it connects to Hotel Street. The transit station for this connection would be located on private property near the intersection of Kaʻaahi Street and Kaʻaahi Place in the industrial area. On-street parking would be removed along portions of Kaʻaahi Street.

Along portions of King Street between Beretania Street and Hotel Street, the column placement would result in the loss of one Koko Head-bound lane (reducing the number of Koko Head-bound lanes in this section from four to three). However, this is not expected to significantly impact traffic flow since the existing four-lane section is short and is fed by only three upstream lanes.

Alignment: Dillingham Boulevard – Nimitz Highway

This long alignment travels from Dillingham Boulevard/Akepo Lane through private property in the industrial area before it connects to Nimitz Highway. The transit station for this connection would be located on private property near the intersection of Kaʻaahi Street and Kaʻaahi Place. On-street parking would be removed along portions of Kaʻaahi Street.

Alignment: Dillingham Boulevard – King Street

This alignment travels from Dillingham Boulevard through private property in the industrial area before it connects to King Street. The transit station for this connection would be located on private property on the ʻEwa side of Iwilei Road in the industrial area. On-street impacts are expected to be minimal.

Section 5: Iwilei to UH Mānoa or Waikīkī

Five alignment options and one branch route are proposed in Section 5: Beretania Street/South King Street; King Street/Waimanu Street/Kapi'olani Boulevard; Hotel Street/Kawaiaha'o Street/Kapi'olani Boulevard; Nimitz Highway/Queen Street/Kapi'olani Boulevard; Nimitz Highway/Halekauwila Street/Kapi'olani Boulevard; and a Waikīkī Branch. Each alignment begins at Iwilei and continues in varying routes ending at UH Mānoa. The Waikīkī Branch begins at Kapi'olani Boulevard and ends at the Koko Head end of Waikīkī.

Alignment: Beretania Street/South King Street

This alignment is approximately 4.0 miles long and generally travels from Iwilei to UH Mānoa via tunnel below Beretania Street and aboveground along South King Street, terminating on the UH Lower Campus. Eight station locations are proposed along this alignment, including the Ka'aahi Street station or the North King Street at Liliha Street station on the connector alignment between Section 4 and Section 5. The following describes the potential impacts along this alignment option:

- The section along Beretania Street from Liliha Street to Alapa'i Street would be in an underground tunnel and would not create permanent impacts aboveground. Access to the municipal parking lot could be affected by this alignment.
- Column placement within the makai side curb lane along South King Street from Alapa'i Street to University Avenue would result in the loss of a peak-hour travel lane and the removal of off-peak on-street parking spaces in the vicinity of the columns.
- A new median on University Avenue from King Street to Varsity Place would affect left-turn access to driveways and adjoining streets.

In addition, two of the proposed stations – the University Avenue and South King Street station and the UH Lower Campus station – may create parking impacts on the adjacent roadways as a result of column placement for the elevated station structures. The proposed University Avenue and South King Street station would be located on University Avenue mauka of King Street. Construction of this elevated station would involve the restriping and reconstruction of the left-turn lanes affected by the modifications necessary for column placement at the South King Street and University Avenue intersection.

The planned UH Lower Campus station would be located on the makai side of Lower Campus Road. Column placement for the UH Lower Campus station would be located makai of the roadway, and no loss of travel lanes and curb parking is anticipated on Lower Campus Road.

Alignment: King Street/Waimanu Street/Kapi'olani Boulevard

This alignment is 4.6 miles long and generally travels from Iwilei to UH Mānoa via tunnel below King Street and Kapi'olani Boulevard to Waimanu Street and aboveground along Waimanu Street and Kona Street and Kapi'olani Boulevard to University Avenue, terminating on the UH Lower Campus. Nine station locations are proposed along this alignment, including the Ka'aahi Street station or the North King Street at Liliha Street station on the connector alignment between Section 4 and Section 5. The following describes the potential impacts along this alignment option:

- The section along King Street and Kapiʻolani Boulevard from River Street to Dreier Street would be in an underground tunnel and would not create permanent transportation impacts aboveground.
- Columns would be placed along the mauka side of Waimanu Street from Ward Avenue to Kamakeʻe Street. Waimanu Street would need to be widened and this would result in the loss of some on-street parking spaces.
- Columns would be placed along the mauka side of Kona Street from Koko Head of Kamakeʻe Street to Piʻikoi Street. Kona Street would need to be widened, resulting in the loss of some on-street parking.
- The columns along Kona Street from Piʻikoi Street to Keʻeaumoku Street would be placed in the median. No impacts are anticipated.
- The elevated structure would transition to the makai side of Kona Street from Keʻeaumoku Street to just ʻEwa of Atkinson Drive. No impacts are anticipated to the roadway.
- Along Kapiʻolani Boulevard from Atkinson Drive to McCully Street, column placement would require a new median and would result in the restriction of left-turn access to driveways along Kapiʻolani Boulevard. Options may be investigated to mitigate these impacts.
- On Kapiʻolani Boulevard between McCully Street and University Avenue, the column would be located in the existing median and no impacts are anticipated.
- The section of University Avenue from Kapiʻolani Boulevard to King Street would have on-street parking impacts and loss of a bike lane as a result of column placement in the median.
- A new median on University Avenue from King Street to Varsity Place would affect left-turn access to driveways and adjoining streets.

In addition, two of the proposed stations – the University Avenue and South King Street station and the UH Lower Campus station – may create parking impacts on the adjacent roadways as a result of column placement for the elevated station structures. The proposed University Avenue and South King Street station would be located on University Avenue mauka of King Street. Construction of this elevated station would involve the restriping and reconstruction of the left-turn lanes affected by the modifications necessary for column placement at the South King Street and University Avenue intersection.

The planned UH Lower Campus station would be located on the makai side of Lower Campus Road. Column placement for the UH Lower Campus station would be located makai of the roadway, and no loss of travel lanes and curb parking is anticipated on Lower Campus Road.

<u>Alignment: Hotel Street/Kawaiahaʻo Street/Kapiʻolani Boulevard</u>

This alignment is approximately 4.6 miles long and generally travels from Iwilei to UH Mānoa via Hotel Street at-grade to a tunnel connecting to Kawaiahaʻo Street and aboveground along Kawaiahaʻo Street and Kona Street and Kapiʻolani Boulevard to University Avenue, terminating on the UH Lower Campus. Twelve station locations are proposed along this alignment, including the Ka‘aahi Street station or the North King Street at Liliha Street station on the connector alignment between Section 4 and Section 5. The following describes the potential impacts along this alignment option:

- The section along Hotel Street from River Street to Alakea Street would be at-grade in the existing transit mall. The vertical transition from elevated to at-grade at the ‘Ewa end of the section would require loss of existing bus lanes in this area. One option would be to move buses off of the Hotel Street transit mall altogether and reroute them to King and Beretania Streets, although this could affect traffic flows along King and Beretania Streets. Another option would be to route the buses back onto Hotel Street via River Street, but this would have buses operating in the same lanes as the fixed guideway along the transit mall and thus buses could block trains. Pedestrian crossings and vehicular cross traffic along Hotel Street may be blocked by the length of trains stopped at stations.
- The alignment transitions from at-grade to underground along Hotel Street between Alakea Street to Richards Street. Hotel Street would be widened to allow Koko Head-bound traffic to continue to Richard Street.
- The section between Richards Street and Kawaiaha‘o Street would be underground and would not create permanent transportation impacts aboveground.
- The alignment would transition to aboveground along the section of Kawaiaha‘o Street from South Street to Cooke Street. The tunnel portal would be placed on the mauka side of the street and Kawaiaha‘o Street would be widened; impacts include reduced on-street parking and blocking of access to Curtis Street.
- The alignment follows Kawaiaha‘o Street from Cooke Street to ‘Ewa of Kamake‘e Street where it transitions in the mauka direction to connect to Kona Street. Kawaiaha‘o Street would be widened and columns would be placed along the makai side, resulting in the loss of on-street parking.
- The columns along Kona Street from Pi‘ikoi Street to Ke‘eaumoku Street would be placed in the median. No impacts are anticipated.
- The elevated structure would transition to the makai side of Kona Street from Ke‘eaumoku Street to just ‘Ewa of Atkinson Drive. No impacts are anticipated to the roadway.
- Along Kapi‘olani Boulevard from Atkinson Drive to McCully Street, column placement would require a new median and would result in the restriction of left-turn access to driveways along Kapi‘olani Boulevard. Options may be investigated to mitigate these impacts.
- On Kapi‘olani Boulevard between McCully Street and University Avenue, the column would be located in the existing median and no impacts are anticipated.
- The section of University Avenue from Kapi‘olani Boulevard to King Street would have on-street parking impacts and loss of a bike lane as a result of column placement in the median.
- A new median on University Avenue from King Street to Varsity Place would affect left-turn access to driveways and adjoining streets.

In addition, two of the proposed stations – the University Avenue and South King Street station and the UH Lower Campus station – may create parking impacts on the adjacent roadways as a result of column placement for the elevated station structures. The proposed University Avenue and South King Street station would be located on University Avenue mauka of King Street. Construction of this elevated station would involve the restriping and reconstruction of the left-turn lanes affected by the modifications necessary for column placement at the South King Street and University Avenue intersection.

The planned UH Lower Campus station would be located on the makai side of Lower Campus Road. Column placement for the UH Lower Campus station would be located makai of the roadway, and no loss of travel lanes and curb parking is anticipated on Lower Campus Road.

Alignment: Nimitz Highway/Queen Street/Kapiʻolani Boulevard

This alignment is approximately 4.6 miles long and generally travels from Iwilei to UH Mānoa via Nimitz Highway, Queen Street, Kona Street, and Kapiʻolani Boulevard to University Avenue, terminating on the UH Lower Campus. Ten stations are planned along this alignment, including the Kaʻaahi Street station or the North King Street at Liliha Street station on the connector alignment between Section 4 and Section 5. The following describes potential impacts along this alignment option:

- Columns would be placed in the existing median in the section of Nimitz Highway from Iwilei to Queen Street. This is expected to have minimal impacts given the existing wide median.
- Columns would be placed on the makai side of Queen Street from Nimitz Highway to Kamakeʻe Street. This would result in the loss of one of the two ʻEwa-bound lanes on Queen Street between Bishop Street and Nimitz Highway. This would also result in a loss of on-street parking spaces and a travel lane in the Kakaʻako area.
- No impacts are expected on the section of Queen Street from Kamakeʻe Street to Waimanu Street. Column placement would be in the median. The alignment would then transition to Kona Street.
- The columns along Kona Street from Piʻikoi Street to Keʻeaumoku Street would be placed in the median. No impacts are anticipated.
- The elevated structure would transition to the makai side of Kona Street from Keʻeaumoku Street to just ʻEwa of Atkinson Drive. No impacts are anticipated to the roadway.
- Along Kapiʻolani Boulevard from Atkinson Drive to McCully Street, column placement would require a new median and would result in the restriction of left-turn access to driveways along Kapiʻolani Boulevard. Options may be investigated to mitigate these impacts.
- On Kapiʻolani Boulevard between McCully Street and University Avenue, the column would be located in the existing median and no impacts are anticipated.
- The section of University Avenue from Kapiʻolani Boulevard to King Street would have on-street parking impacts and loss of a bike lane as a result of column placement in the median.
- A new median on University Avenue from King Street to Varsity Place would affect left-turn access to driveways and adjoining streets.

In addition, two of the proposed stations – the University Avenue and South King Street station and the UH Lower Campus station – may create parking impacts on the adjacent roadways as a result of column placement for the elevated station structures. The proposed University Avenue and South King Street station would be located on University Avenue mauka of King Street. Construction of this elevated station would involve the restriping and reconstruction of the left-turn lanes affected by the modifications necessary for column placement at the South King Street and University Avenue intersection.

The planned UH Lower Campus station would be located on the makai side of Lower Campus Road. Column placement for the UH Lower Campus station would be located makai of the roadway, and no loss of travel lanes and curb parking is anticipated on Lower Campus Road.

<u>Alignment: Nimitz Highway/Halekauwila Street/Kapi‘olani Boulevard</u>

This alignment is approximately 4.7 miles long and generally travels from Iwilei to UH Mānoa via Nimitz Highway, Halekauwila Street, Kona Street, and Kapi‘olani Boulevard to University Avenue, terminating on the UH Lower Campus. Ten station locations are proposed along this alignment, including the Ka‘aahi Street station or the North King Street at Liliha Street station on the connector alignment between Section 4 and Section 5. The following describes the potential impacts along this alignment option:

- Columns would be placed in the existing median in the section of Nimitz Highway from Iwilei to Queen Street. This is expected to have minimal impacts given the existing wide median.
- Column placement on Halekauwila Street from Nimitz Highway to Ward Avenue would be along the makai side of the street, resulting in the loss of on-street parking spaces in the vicinity of the columns.
- The alignment would remain elevated and transition to Queen Street in the vicinity of Ward Avenue. This would result in the loss of on-street parking spaces and a travel lane along Queen Street, ‘Ewa of Kamake‘e Street.
- No impacts are expected on the section of Queen Street from Kamake‘e Street to Waimanu Street. Column placement would be in the median. The alignment would then transition to Kona Street.
- The columns along Kona Street from Pi‘ikoi Street to Ke‘eaumoku Street would be placed in the median. No impacts are anticipated.
- The elevated structure would transition to the makai side of Kona Street from Ke‘eaumoku Street to just ‘Ewa of Atkinson Drive. No impacts are anticipated to the roadway.
- Along Kapi‘olani Boulevard from Atkinson Drive to McCully Street, column placement would require a new median and would result in the restriction of left-turn access to driveways along Kapi‘olani Boulevard. Options may be investigated to mitigate these impacts.
- On Kapi‘olani Boulevard between McCully Street and University Avenue, the column would be located in the existing median and no impacts are anticipated.

- The section of University Avenue from Kapiʻolani Boulevard to King Street would have on-street parking impacts and loss of a bike lane as a result of column placement in the median.
- A new median on University Avenue from King Street to Varsity Place would affect left-turn access to driveways and adjoining streets.

In addition, two of the proposed stations – the University Avenue and South King Street station and the UH Lower Campus station – may create parking impacts on adjacent roadways as a result of column placement for the elevated station structures. The proposed University Avenue and South King Street station would be located on University Avenue mauka of King Street. Construction of this elevated station would involve the restriping and reconstruction of the left-turn lanes affected by the modifications necessary for column placement at the South King Street and University Avenue intersection.

The planned UH Lower Campus station would be located on the makai side of Lower Campus Road. Column placement for the UH Lower Campus station would be located makai of the roadway, and no loss of travel lanes and curb parking is anticipated on Lower Campus Road.

Alignment: Waikīkī Branch

This alignment is approximately 1.5 miles long and travels from the intersection of Kalākaua Avenue/Kapiʻolani Boulevard to the Koko Head side of Waikīkī. The spur follows Kalākaua Avenue to Kūhiō Avenue, ending at Kaʻiulani Avenue. Three station locations are proposed along this alignment. The following describes the potential impacts along this alignment option:

- The spur alignment would follow along the Koko Head side of Kalākaua Avenue between Kapiʻolani Boulevard and Kūhiō Avenue. There would be a loss of one ʻEwa-bound lane between Ala Way Boulevard and ʻEna Road in Waikīkī.
- Along Kūhiō Avenue, from Kalākaua Avenue to Kaʻiulani Avenue, the alignment would follow the mauka side of the street. This would result in the loss on one ʻEwa-bound lane. Parking and loading zones may be created in pockets between columns.

Appendix B Impacts on Non-Motorized Transportation

Potential conflicts or physical impacts created by the construction of proposed guideway alternatives on existing and proposed bicycle facilities and the pedestrian circulation system are evaluated in this appendix. Information regarding the existing and proposed bikeway system was obtained from *Bike Plan Hawai'i* (HDOT, 2003) and the *Honolulu Bicycle Master Plan* (April, 1999). As previously detailed, there are five primary sections to the Fixed Guideway Alternative; within each section are several alignment options. The impacts of the elevated fixed guideway structure and station placement on the bicycle facilities and pedestrian system vary among the alignment options, but many of the issues are common.

Section 1: Kapolei to Fort Weaver Road

Four alignment options are proposed in Section 1, beginning at the Kapolei Parkway and Hanua Street terminal station and continuing in varying routes ending at Fort Weaver Road. The following describes the potential impacts on the bicycle and pedestrian system from construction of each fixed guideway alignment.

Alignment: Kamokila Boulevard/Farrington Highway

This alignment is approximately 6.1 miles long and generally follows Kapolei Parkway to Kamokila Boulevard to Farrington Highway and ends at Fort Weaver Road. One existing bike facility and three future bike facilities are identified in the vicinity of the proposed fixed guideway alignment. Bike lanes currently exist on Kapolei Parkway, Kamokila Boulevard, and Farrington Highway from Kamokila Boulevard to Kapolei Golf Course Road, generally following the proposed fixed guideway alignment. Future proposed bike facilities include the extension of the bike lane on Kapolei Parkway from Kalaeloa Boulevard to Ali'inui Drive near Ko 'Olina Golf Club, the addition of signed shared roadway (bike route) on Farrington Highway from Kapolei Golf Course Road to Fort Weaver Road, and the addition of a bike path on Farrington Highway from the future North-South Road to Fort Weaver Road. The alignment is located in the currently lower density area of Kapolei. A pedestrian circulation system may be developed later with the future Kapolei development. The following describes the potential issues regarding non-motorized transportation resulting from construction of each section along this alignment:

- The fixed guideway sections along Kapolei Parkway from Hanua Street to Kamokila Boulevard, Kamokila Boulevard from Kapolei Parkway to Farrington Highway, and Farrington Highway from Kamokila Boulevard to Golf Course Road would be elevated and be located on the median on Kapolei Parkway. With the wide median of the future Kapolei Parkway, column placement is not expected to affect the continued use of existing bike lanes or future operations on signed bike routes along Kapolei Parkway or Kalaeloa Boulevard. Conflicts may occur between transit buses/vehicles and pedestrian movements at the Kapolei Parkway/Kamokila Boulevard intersection, the major access point to the Kapolei Parkway and Hanua Street terminal station.

- The section along Farrington Highway from Golf Course Road to Old Fort Weaver Road would be elevated off of the street along the makai side. Since this would be off-street, it would not conflict with bike operations on Farrington Highway. Column placement is not expected to interrupt pedestrian flow.
- The section along Farrington Highway from Old Fort Weaver Road to Fort Weaver Road would be elevated off of the street along the mauka side of the roadway. Steps should be taken to ensure that this does not conflict with bike operations on the proposed bike path and signed bike route along the mauka side of Farrington Highway. Column placement is not expected to interrupt pedestrian flow.

Alignment: Kapolei Parkway/North-South Road

This alignment is approximately 7.2 miles long and generally travels along Kapolei Parkway to North-South Road to Farrington Highway and ends at Fort Weaver Road. The alignment is located in the currently lower density area of Kapolei. A pedestrian circulation system may be developed later with the campus of UH West O‘ahu and with the DHHL Development. Three future bike facilities are identified in the vicinity of the proposed alignment, including the proposed bike lane on Kapolei Parkway and North-South Road, a proposed signed bike route along Farrington Highway from North-South Road to Fort Weaver Road, and the proposed bike path along Farrington Highway from the future North-South Road to Fort Weaver Road. The following describes the potential issues regarding non-motorized transportation resulting from construction of each section along this alignment:

- The fixed guideway sections along Kapolei Parkway and North-South Road would be elevated and above the medians. With the expected wide median on the Kapolei Parkway extension and the future North-South Road, column placement is not expected to affect pedestrian movement or bike operations of the proposed bike lanes on Kapolei Parkway and North-South Road.
- The section along Farrington Highway from Golf Course Road to Old Fort Weaver Road would be elevated off of the street along the makai side. Since this would be off-street, it would not conflict with bike operations on Farrington Highway. Column placement is not expected to interrupt pedestrian flow.
- The section along Farrington Highway from Old Fort Weaver Road to Fort Weaver Road would be elevated off of the street along the mauka side of the roadway. Steps should be taken to ensure that this does not conflict with bike operations on the proposed bike path and signed bike route along the mauka side of Farrington Highway. Column placement is not expected to interrupt pedestrian flow.

Alignment: Saratoga Avenue/North-South Road

This alignment is approximately 9.0 miles long and generally travels from the Kapolei terminus to Wākea Street to Saratoga Avenue and to North-South Road to Farrington Highway, ending at Fort Weaver Road. The pedestrian circulation system would be developed later with future Kalaeloa Development and future campus of UH West O‘ahu. One existing and six future bike facilities are identified in the vicinity of the proposed alignment, including the existing bike lanes and proposed bike lane extension on Kapolei Parkway Wai'anae of Kamokila Boulevard, the Leeward Bikeway on Roosevelt Avenue that is currently under construction, the proposed signed bike routes on Enterprise Street and along Farrington Highway from North-South Road to Fort Weaver Road, and the proposed bike paths on Coral Sea Road and along Farrington Highway from the future North-South Road to Fort Weaver Road. The following describes the potential issues regarding non-motorized transportation resulting from construction of each section along this alignment:

- The fixed guideway section along Kapolei Parkway from Hanua Street to Wākea Street would be elevated and located above the median. With the wide median of the future Kapolei Parkway, column placement is not expected to affect the continued use of existing bike lanes or future operations on signed bike routes along Kapolei Parkway. Conflicts may occur between transit buses/vehicles maneuvers and pedestrian movement at the Kapolei Parkway/Kamokila Boulevard intersection, the major access point to the Kapolei Parkway and Hanua Street terminal station.
- The section along Wākea Street from Kapolei Parkway to Saratoga Avenue would be elevated and located above the median. Column placement is not expected to impact pedestrian access or bicycle operations of the Leeward Bikeway on Roosevelt Avenue.
- The section along Saratoga Avenue from Wākea Street to North-South Road would be at-grade within the median. This alignment is not expected to impact the pedestrian system or operations of the proposed signed bike route on Enterprise Street or the proposed bike path on Coral Sea Road.
- The section along North-South Road would be elevated and located above the median. Column placement is not expected to impact future pedestrian circulation or operations of proposed bike lanes on North-South Road.
- The section along Farrington Highway from Golf Course Road to Old Fort Weaver Road would be located off the street along the makai side, with some portions being elevated and some at-grade. Since this would be off-street, it would not conflict with bike operations on Farrington Highway. Column placement is not expected to interrupt pedestrian flow.
- The section along Farrington Highway from Old Fort Weaver Road to Fort Weaver Road would be elevated off of the street along the mauka side of the roadway. Steps should be taken to ensure that this does not conflict with bike operations on the proposed bike path and signed bike route along the mauka side of Farrington Highway. Column placement is not expected to interrupt pedestrian flow.

<u>Alignment: Geiger Road/Fort Weaver Road</u>

This alignment is approximately 8.9 miles long and generally travels from the Kapolei fixed guideway terminus to Wākea Street to Saratoga Avenue to Geiger Road to Fort Weaver Road, ending at Farrington Highway. Pedestrian circulation has been developed in the high-density residential neighborhoods along Geiger Road and Fort Weaver Road. Several existing and future bike facilities may be affected as a result of construction of the proposed alignment, including the existing bike lanes and proposed bike lane extension on Kapolei Parkway Wai'anae of Kamokila Boulevard; existing bike paths and proposed bike lanes on Geiger Road; existing bike path and proposed signed bike route along and across Fort Weaver Road; the Leeward Bikeway on Roosevelt Avenue currently under construction; the proposed signed bike route along Enterprise Street; and the proposed bike lanes and bike routes on Hanson Road. The following describes the potential issues regarding non-motorized transportation resulting from construction of each fixed guideway section along this alignment:

- The fixed guideway section along Kapolei Parkway from Hanua Street to Wākea Street would be elevated above the median. With the wide median of the future Kapolei Parkway, column placement is not expected to affect continued use of existing bike lanes or future operations on signed bike routes along Kapolei Parkway. Conflicts may occur between transit buses/vehicles maneuvers and pedestrian movement at the Kapolei Parkway/Kamokila Boulevard intersection, the major access point to the Kapolei Parkway and Hanua Street station.
- The section along Wākea Street from Kapolei Parkway to Saratoga Avenue would be elevated above the median. Column placement is not expected to impact pedestrian access or bicycle operations of the Leeward Bikeway on Roosevelt Avenue.
- The section along Saratoga Avenue from Wākea Street to North-South Road would be at-grade within the median. This alignment is not expected to impact the pedestrian system or operations of the proposed signed bike route on Enterprise Street or the proposed bike path on Coral Sea Road.
- The section along Geiger Road from North-South Road to Fort Weaver Road would be elevated above a new median. Geiger Road would be widened to accommodate the new median. This could affect existing bike paths and proposed bike lanes on Geiger Road and the proposed bike lanes and bike routes on Hanson Road.
- The section along Fort Weaver Road from Geiger Road to Farrington Highway would be elevated above the median. The impact of column placement would be minimal on pedestrian circulation and operations of the existing bike path and proposed signed bike route along and across Fort Weaver Road.

Section 2: Fort Weaver Road to Aloha Stadium

Only one alignment option is proposed in Section 2, traveling primarily along Farrington Highway and Kamehameha Highway. The following describes the potential issues regarding non-motorized transportation resulting from construction of this alignment.

Alignment: Farrington Highway/Kamehameha Highway

Existing uses along the alignment are primarily mixed residential and commercial. The pedestrian system is generally developed and well connected along the proposed fixed guideway alignment. Several existing and future bike facilities in the vicinity of the proposed alignment are identified, including the existing signed bike route and proposed bike lane on Farrington Highway; proposed bike lanes makai of Farrington Highway on Waipahu Depot Road, Mokuola Street, and Paiwa Street; the proposed bike path on Waipiʻo Point Access Road; proposed bike lanes on Kamehameha Highway from Farrington Highway to Salt Lake Boulevard; and the Pearl Harbor Bike Path parallel to Farrington Highway. The following describes the potential issues regarding non-motorized transportation resulting from construction of each section along this alignment:

- The fixed guideway section along Farrington Highway from Fort Weaver Road to Kamehameha Highway would be elevated above the median. With the wide median, column placement on Farrington Highway is expected to have minimal impacts on pedestrian circulation and existing and proposed bike facilities on and across Farrington Highway.
- The section along Kamehameha Highway from Farrington Highway to Salt Lake Boulevard would be elevated above the median. Column placement on Farrington Highway is expected to have minimal impacts on the pedestrian system or proposed bike lanes on Kamehameha Highway.

Section 3: Aloha Stadium to Middle Street

Four alignment options are proposed in Section 3, each beginning at the junction of Salt Lake Boulevard and Kamehameha Highway ‘Ewa of the Aloha Stadium and continuing in varying routes ending in the vicinity of Ke‘ehi Interchange and Middle Street. All stations are well connected by roadways under all alignments in Section 3. The following describes the potential issues regarding non-motorized transportation resulting from construction of each alignment:

Alignment: Salt Lake Boulevard

This alignment is approximately 4.8 miles long and generally extends from Aloha Stadium along Salt Lake Boulevard to Pūkōloa Street, joins the Moanalua Freeway, and ends at Middle Street. An alternative alignment travels from Pukuloa Street along the Koko Head side of the Moanalua Stream and ends at the Ke‘ehi Interchange. The pedestrian system has been generally developed along the proposed Salt Lake Boulevard alignment, with proximity to high-density residential neighborhoods. Future bike lane extensions are proposed on Salt Lake Boulevard from Kamehameha Highway to Arizona Boulevard and from Pu‘uloa Road to Middle Street. The following describes the potential issues regarding non-motorized transportation resulting from construction of each section along this alignment:

- The fixed guideway section along Salt Lake Boulevard from Kamehameha Highway to Pu‘uloa Road would be elevated above both existing and new medians. Column placement on Salt Lake Boulevard may conflict with bike operations on the proposed bike lane on Salt Lake Boulevard. The impact on pedestrian circulation is expected to be minimal.
- The section along Pukuloa Street from Pu‘uloa Road to Ahua Street would be elevated and located on the makai-side curb lane. Column placement is not expected to interrupt pedestrian flow.
- The alternative section along the Moanalua Freeway from Pu‘uloa Road to the H-1 Freeway would be elevated and located off-street Koko Head side of Moanalua Freeway. No bike facilities exist or are proposed in the vicinity of this alignment; therefore, no bike access impacts are expected for this section. Column placement is not expected to interrupt pedestrian flow.

Alignment: Mauka of the Airport Viaduct

This alignment is approximately 5.1 miles long and generally extends from Aloha Stadium along Kamehameha Highway to the H-1 Freeway, which it crosses and continues mauka of the Airport Viaduct to the Ke‘ehi Interchange. Pedestrian circulation is less integrated in the vicinity of the Airport Viaduct. An existing bike path is identified along Nimitz Highway in the vicinity of the proposed alignment. Column placement for the elevated fixed guideway structure would be in the median of Kamehameha Highway and off-street along the mauka portion of the H-1 Freeway right-of-way; no impacts to pedestrian or bike movements are expected. The at-grade option mauka of the H-1 Freeway would create grade crossings at Camp Catlin Road and Catlin Drive.

Alignment: Makai of the Airport Viaduct

This alignment is approximately 5.2 miles long and generally travels from Aloha Stadium along Kamehameha Highway to the H-1 Freeway and continues along Nimitz Highway, makai of the Airport Viaduct, to the Ke‘ehi Interchange. Pedestrian circulation is less integrated in the vicinity of the Airport Viaduct. An existing bike path is identified along Nimitz Highway in the vicinity of the proposed alignment. As column placement for the elevated fixed guideway structure would be in the median of Kamehameha Highway and on the makai side of the H-1 Freeway right-of-way, impacts on pedestrian access or bike operations on the existing bike path on Nimitz Highway are expected to be minimal.

Alignment: Aolele Street

This alignment is approximately 5.4 miles long and generally travels from Aloha Stadium along Kamehameha Highway to the H-1 Freeway and continues makai of the Airport Viaduct to Aolele Street, turning toward the airport along Aolele Street and continuing to Dillingham Boulevard via Lagoon Drive. Pedestrian circulation is less integrated in the vicinity of Aolele Street. In the vicinity of the proposed alignment, a bike path currently exists on Nimitz Highway and a bike lane on Pu‘uloa Road from Salt Lake Boulevard to Lagoon Drive is currently being extended. As column placement for the elevated fixed guideway structure would be in the median of Kamehameha Highway and off-street along Aolele Street, the intrusion on pedestrian circulation or future operations of bike facilities on Nimitz Highway and Lagoon Drive are expected to be minimal.

Section 4: Middle Street to Iwilei

Two alignment options are proposed in Section 4, each beginning at the Ke‘ehi Interchange and continuing in varying routes via North King Street or Dillingham Boulevard ending in Iwilei. The following describes the potential issues regarding non-motorized transportation resulting from construction of each section along this alignment:

Alignment: North King Street

This alignment is approximately 2.3 miles long and generally extends from the Ke‘ehi Interchange through the Middle Street Transit Center, along Middle Street and continues Koko

Head along North King Street to Liliha Street. This alignment extends though an industrial area in Kalihi and mixed residential/commercial uses along King Street. The pedestrian system around King Street is generally developed and connected around the proposed fixed guideway alignment. The proposed bike facilities on North King Street, Liliha Street, and Waiakamilo Road may be affected as a result of construction of the proposed alignment.

- The section along Middle Street from Nimitz Highway to North King Street would be elevated and located off-street. No impacts are expected to the pedestrian system or the proposed bike facility on Middle Street.
- The section along King Street from Middle Street to Kopke Street would be elevated and located on the makai side. Column placement in this section may conflict with the proposed bike facility on North King Street. Column placement is not expected to interrupt pedestrian flow
- The section along King Street from Kopke Street to Liliha Street would be elevated and located on the mauka side of the street. Column placement in this section may conflict with bike operations on the proposed bike facilities on North King Street. Column placement is not expected to interrupt pedestrian flow.

<u>Alignment: Dillingham Boulevard</u>

This alignment is approximately 1.8 miles long and generally travels from the Ke'ehi Interchange to Iwilei via Dillingham Boulevard. The proposed bike facilities on Dillingham Boulevard from Middle Street to Kōkea Street, Waiakamilo Road, and Alakawa Street may be affected as a result of construction of the proposed alignment.

- The proposed Dillingham Boulevard alignment would be elevated and located on a new median. Because of the narrow width of Dillingham Boulevard, column placement in this section may conflict with the proposed bike facilities on Dillingham Boulevard and may negatively affect future biking around the alignment.

Section 5: Iwilei to UH Mānoa

Five alignment options and one spur route to Waikīkī are proposed in Section 5, each beginning at Iwilei and continues in varying routes ending at UH Mānoa. The following describes the potential issues regarding the bike and pedestrian access due to the construction of each section along this alignment:

<u>Alignment: Beretania Street/South King Street</u>

This alignment is approximately 4.0 miles long and generally extends from Iwilei to UH Mānoa via tunnel below Beretania Street and aboveground along South King Street. The pedestrian system is generally well connected along the alignment, with easy access to adjacent commercial or residential uses. An existing bike route is currently located on University Avenue from South King Street to Dole Street, and bike facilities are proposed on Beretania Street, South King Street and McCully Street, the couplet of Pensacola Street, and Pi'ikoi Street.

- The section along Beretania Street from Liliha Street to Alapa‘i Street would be in an underground tunnel and would not permanently impact pedestrian or bike systems aboveground.
- Column placement within the makai side curb lane along South King Street from Alapa‘i Street to University Avenue would result in the loss of a peak-hour travel lane and could affect proposed bike facilities on King Street.
- The section along University Avenue near UH Mānoa would be elevated in the median of University Avenue and on the makai side of Lower Campus Road. Column placement in this section may conflict with bike movement on University Avenue. Column placement is not expected to interrupt pedestrian flow.

<u>Alignment: King Street/Waimanu Street/Kapi‘olani Boulevard</u>

This alignment is about 4.6 miles long and generally extends from Iwilei to UH Mānoa via tunnel below King Street and Kapi‘olani Boulevard to Waimanu Street and aboveground along Waimanu Street and Kona Street and Kapi‘olani Boulevard to University Avenue, terminating on the UH Lower Campus. The pedestrian system is well connected along portions of the alignment, although sidewalks are not continuous along Waimanu Street in the Kaka‘ako area. In the vicinity of the fixed guideway alignment there is an existing bike route on University Avenue from South King Street to Dole Street and proposed bike facilities on Cooke Street, Queen Street, Kapi‘olani Boulevard, McCully Street, and Kalākaua Avenue.

- The section along King Street and Kapi‘olani Boulevard from River Street to Dreier Street would be in an underground tunnel and would not permanently impact pedestrian or bike systems aboveground.
- The section along Waimanu Street from Ward to Kamake‘e Street would be elevated and located on the mauka side of Waimanu Street. No impacts are anticipated on future bike movement along Kapi‘olani Boulevard and Cooke Street. Column placement is not expected to interrupt pedestrian flow
- The section along Kona Street from Koko Head of Kamake‘e to Pi‘ikoi Street to ‘Ewa of Atkinson Drive would be elevated and located in-street. Column placement is not expected to interrupt pedestrian flow in the vicinity of Ala Moana Center.
- The section along Kapi‘olani Boulevard from Atkinson Drive to University Avenue would be elevated and located in existing and new median. Column placement could affect left-turn access of bicycles to cross streets and driveways along Kapi‘olani Boulevard. Impacts on pedestrians are expected to be minimal.
- The section along University Avenue from Kapi‘olani Boulevard to King Street would be elevated above the median. This would require removal of an existing bike lane and reduce clearance between bicyclists and vehicular traffic. Impacts on pedestrians are expected to be minimal.
- The section along University Avenue from King Street to Varsity Place would be elevated above a new median. Column placement in this section may reduce clearance between bicyclists and vehicular traffic and affect left-turn access of bicyclists to cross streets and driveways along University Avenue. An existing bike lane on University Avenue would be removed. Impacts on pedestrians are expected to be minimal.

Alignment: Hotel Street/Kawaiahaʻo Street/Kapiʻolani Boulevard

This alignment is approximately 4.6 miles long and generally extends from Iwilei to UH Mānoa via Hotel Street to a tunnel connecting to Kawaiahaʻo Street and aboveground along Kawaiahaʻo Street and Kona Street and Kapiʻolani Boulevard to University Avenue. The pedestrian system is well connected along portions of the alignment, although sidewalks are not continuous along Kawaiahaʻo Street in the Kakaʻako area. In the vicinity of the fixed guideway alignment, there is an existing bike route on University Avenue from South King Street to Dole Street and proposed bike facilities on Cooke Street, Queen Street, Kapiʻolani Boulevard, McCully Street, and Kalākaua Avenue.

- The section on Hotel Street from River Street to Alakea Street would be at-grade in the existing transit mall. A high level of pedestrian activity currently occurs along the Hotel Street transit mall and along the Kekaulike pedestrian mall in the vicinity of the proposed transit station. Bicycle movement and access to properties along Hotel Street may be obstructed as a result of train operations.
- The alignment transitions from at-grade to underground section along Hotel Street between Alakea Street to Richards Street. No permanent impacts are anticipated on the pedestrian or bike systems aboveground.
- The section along Richards Street from Kawaiahaʻo Street/South Street would be in an underground tunnel and would not create permanent impacts to the pedestrian or bike systems aboveground.
- The section along Kawaiahaʻo Street from Cooke Street to ʻEwa of Kamakeʻe Street would be elevated. No impacts are anticipated on the proposed Cooke Street bike route.
- The section along Kona Street from Koko Head of Kamakeʻe to Piʻikoi Street to ʻEwa of Atkinson Drive would be elevated and located in-street. Column placement is not expected to interrupt pedestrian flow in the vicinity of Ala Moana Center.
- The section along Kapiʻolani Boulevard from Atkinson Drive to University Avenue would be elevated and located in existing and new median. Column placement could affect left-turn access of bicycles to cross streets and driveways along Kapiʻolani Boulevard. Impacts on pedestrians are expected to be minimal.
- The section along University Avenue from Kapiʻolani Boulevard to King Street would be elevated above the median. This would require removal of an existing bike lane and reduce clearance between bicyclists and vehicular traffic. Impacts on pedestrians are expected to be minimal.
- The section along University Avenue from King Street to Varsity Place would be elevated above a new median. Column placement in this section may reduce clearance between bicyclists and vehicular traffic and affect the left-turn access of bicyclists to cross streets and driveways along University Avenue. An existing bike lane on University Avenue would be removed. Impacts on pedestrians are expected to be minimal.

Alignment: Nimitz Highway/Queen Street/Kapiʻolani Boulevard

This alignment is approximately 4.6 miles long and generally extends from Iwilei to UH Mānoa via Nimitz Highway, Queen Street, Kona Street and Kapiʻolani Boulevard to University Avenue.

The pedestrian system along the alignment is generally developed and connected, although sidewalks are not continuous along portions of Queen Street in the Kaka'ako area. Two existing and several proposed future bike facilities are identified in the vicinity of the fixed guideway alignment, including an existing bike lane on Nimitz Highway, an existing bike route on University Avenue from South King Street to Dole Street, and proposed bike facilities on Ala Moana Boulevard, Cooke Street, Queen Street, Kapi'olani Boulevard, McCully Street, and Kalākaua Avenue.

- The section along Nimitz Highway would be elevated above the median. No impacts are expected to the pedestrian and bike system.
- The section along Queen Street from Nimitz Highway to Kamake'e Street would be elevated. Column placement would affect the proposed bike facility on Queen Street.
- The section along Queen Street from Kamake'e Street to Waimanu Street would be elevated. Column placement would reduce the clearance between pedestrians/bicyclists and vehicular traffic.
- The section along Kona Street from Koko Head of Kamake'e to Pi'ikoi Street to 'Ewa of Atkinson Drive would be elevated and located in-street. Column placement is not expected to interrupt pedestrian flow in the vicinity of Ala Moana Center.
- The section along Kapi'olani Boulevard from Atkinson Drive to University Avenue would be elevated and located in existing and new median. Column placement could affect left-turn access of bicycles to the cross streets and driveways along Kapi'olani Boulevard. Impacts on pedestrians are expected to be minimal.
- The section along University Avenue from Kapi'olani Boulevard to King Street would be elevated above the median. This would require removal of an existing bike lane and reduce clearance between bicyclists and vehicular traffic. Impacts on pedestrians are expected to be minimal.
- The section along University Avenue from King Street to Varsity Place would be elevated above a new median. Column placement in this section may reduce clearance between bicyclists and vehicular traffic and affect the left-turn access of bicyclists to cross streets and driveways along University Avenue. An existing bike lane on University Avenue would be removed. Impacts on pedestrians are expected to be minimal.

<u>Alignment: Nimitz Highway/Halekauwila Street/Kapi'olani Boulevard</u>

This alignment is approximately 4.7 miles long and generally extends from Iwilei to UH Mānoa via Nimitz Highway, Halekauwila Street, Kona Street and Kapi'olani Boulevard to University Avenue. The pedestrian system along the alignment is generally developed and connected, although sidewalks are not continuous along portions of Halekauwila Street in the Kaka'ako area. Two existing and several proposed future bike facilities are identified in the vicinity of the fixed guideway alignment, including an existing bike lane on Nimitz Highway, an existing bike route on University Avenue from South King Street to Dole Street, and proposed bike facilities on Ala Moana Boulevard, Cooke Street, Queen Street, Kapi'olani Boulevard, McCully Street, and Kalākaua Avenue.

- The section along Nimitz Highway would be elevated above the median. No impacts are expected to the pedestrian and bike system.
- The section of Halekauwila Street from Nimitz Highway to Kamake‘e Street would be elevated. Halekauwila Street is not an existing or future designated bike route.
- The section along Queen Street from Kamake‘e Street to Waimanu Street would be elevated. Column placement could affect bike access and reduce clearance between pedestrians/bicyclists and vehicular traffic.
- The section along Kona Street from Koko Head of Kamake‘e to Pi‘ikoi Street to ‘Ewa of Atkinson Drive would be elevated and located in-street. Column placement is not expected to interrupt pedestrian flow in the vicinity of Ala Moana Center.
- The section along Kapi‘olani Boulevard from Atkinson Drive to University Avenue would be elevated and located in existing and new median. Column placement could affect left-turn access of bicycles to the cross streets and driveways along Kapi‘olani Boulevard. Impacts on pedestrians are expected to be minimal.
- The section along University Avenue from Kapi‘olani Boulevard to King Street would be elevated above the median. This would require removal of an existing bike lane and reduce clearance between bicyclists and vehicular traffic. Impacts on pedestrians are expected to be minimal.
- The section along University Avenue from King Street to Varsity Place would be elevated above a new median. Column placement in this section may reduce clearance between bicyclists and vehicular traffic and affect the left-turn access of bicyclists to cross streets and driveways along University Avenue. An existing bike lane on University Avenue would be removed. Impacts on pedestrians are expected to be minimal.

Alignment: Waikīkī Branch

This alignment is approximately 1.5 miles long and travels from the intersection of Kalākaua Avenue/Kapi‘olani Boulevard to the Koko Head side of Waikīkī. The spur follows Kalākaua Avenue to Kūhiō Avenue, ending at Ka‘iulani Avenue. The pedestrian system along the alignment is well integrated and heavily used. Bike facilities are proposed on Kapi‘olani Boulevard and Kalākaua Avenue in the vicinity of the fixed guideway alignment.

The sections on Kalākaua Avenue and Kūhiō Avenue would be elevated. Column placement along the Waikīkī Branch could reduce clearance between bicyclists and vehicular traffic and affect access of bicyclists to cross streets and driveways along Kalākaua Avenue. Column placement is not expected to interrupt pedestrian flow.

Appendix C Station Access Analysis

This appendix discusses the level of access of each transit station via the modes most appropriate for that station's location along the fixed guideway route. There are five sections to the Fixed Guideway Alternative and within each section are several alignment options. The locations of stations vary among the alignment options, but many of the issues are the same.

In addition to the potential stations, several locations have been identified for placement of facilities in support of the fixed guideway. These facilities include maintenance/storage facilities, park-and-ride lots, and a transit center. Three locations have been identified for a maintenance and storage facility in Sections 1 and 2, although only one location will ultimately be selected.

Section 1: Kapolei to Fort Weaver Road

Four alignment options are proposed in Section 1, beginning at the Kapolei Parkway and Hanua Street terminal station and continuing in varying routes ending at Fort Weaver Road. Two of the three potential locations for a maintenance and storage facility have been identified in Section 1. One potential location, the Farrington Highway site, is located on currently vacant land on the mauka side of Farrington Highway near Kapolei Golf Course Road. The other potential location, the Kalaeloa site, is located on a vacant site ‘Ewa of the Wākea Street/Saratoga Avenue intersection. Each alignment option serves from five to eight stations. The following describes the Kapolei Parkway and Hanua Street Station, the starting point for all alignment options:

- Kapolei Parkway and Hanua Street: This proposed station is located on vacant land adjacent to the future Kapolei Parkway extension roadway ‘Ewa of Kalaeloa Boulevard. This elevated station would have a mezzanine. A park-and-ride lot with approximately 1,200 stalls would be provided. Opportunities for priority parking would be available. Consideration should be given to the extensions of safe pedestrian and bike routes from the terminal to the intersection of Kalaeloa Boulevard and Kapolei Parkway.

The following sections describe other stations along each alignment option:

<u>Alignment: Kamokila Boulevard/Farrington Highway</u>

This 6.1-mile-long alignment provides access to five possible stations, including the Kapolei Parkway and Hanua Street station. Given the proximity of Farrington Highway, easy vehicular access is provided to all five planned stations. The four proposed station sites besides the Kapolei and Hanua station are as follows:

- Kamokila Boulevard and Wākea Street: The southwest corner of the Kamokila Boulevard/Wākea Street intersection is currently a vacant block and may be a potential site for the future Kamokila Boulevard and Wākea Street station. This station would be well connected by roads and provide a major bus interface. It would have an elevated platform and mezzanine. This station would provide easy access for pedestrian, transit, and bike access.

- Farrington Highway at UH West Oʻahu: The proposed Farrington Highway at UH West Oʻahu station is located on the future campus site for UH West Oʻahu. This station would be elevated and would primarily serve the western portion of the campus. The station would provide a park-and-ride lot with approximately 1,700 stalls on the mauka side of Farrington Highway and therefore should have easy vehicular access. Easy pedestrian and bike access to the station are expected given the campus environment.
- Farrington Highway and North-South Road: The proposed Farrington Highway and North-South Road station would be located on the northeast corner of the future campus site for UH West Oʻahu. This station would be elevated and have a mezzanine. A park-and-ride lot with approximately 1,700 stalls would be provided near the Farrington Highway/North-South Road intersection. Feeder services between this planned station and major destinations on the UH West Oʻahu campus and the future D.R. Horton Development are expected. Easy pedestrian and bike access to the station are expected because of proximity to campus.
- Farrington Highway between North-South Road and Fort Weaver Road: The proposed station is located on a vacant land makai of Farrington Highway approximately one-half mile ʻEwa of Old Fort Weaver Road. This station may serve the residents and visitors of the future D.R. Horton Development. Primary access to the station would be by vehicle. Easy pedestrian and bike access to the station are expected given the campus environment.

Alignment: Kapolei Parkway/North-South Road

This approximately 7.2-mile-long alignment provides access to six possible stations, including the Kapolei Parkway and Hanua Street station. This alignment connects four major future development areas: the Kapolei development area bounded by Kamokila Boulevard, Fort Barrette Road, and Renton Road in Kapolei; the DHHL Development; the campus for UH West Oʻahu; and the D.R. Horton Development. The five proposed station sites besides the Kapolei Parkway and Hanua Street station are as follows:

- Kapolei Parkway and Wākea Street: The proposed Kapolei Parkway and Wākea Street station would be located on vacant land adjacent to the future Kapolei Parkway extension roadway Koko Head of Ulupia Street. The station designs include the development of the relocated Kapolei bus transit center. This station would have an elevated platform and mezzanine.
- Kapolei Parkway and North-South Road: The proposed Kapolei Parkway and North-South Road station would be located on the southern end of the future DHHL Development in proximity of the future intersection of the Kapolei Parkway extension roadway and the new North-South Road. This station would be well-connected by roads and would have an elevated platform and mezzanine.
- North-South Road between Kapolei Parkway and Farrington Highway: The proposed station would be located on the southern end of the new UH West Oʻahu campus on North-South Road, adjacent to the future DHHL Development. This station would be elevated and have a mezzanine. Feeder services between this planned station and major destinations on the UH West Oʻahu campus and the future DHHL Development are expected. Easy pedestrian and bike access to the station are expected because of

proximity to the campus, potential transit-oriented development adjacent to the campus, and the proposed bike lane on North-South Road.

- Farrington Highway and North-South Road: The proposed Farrington Highway and North-South Road station would be located on the northeast corner of the future campus site for UH West Oʻahu. This station would be elevated and have a mezzanine. A park-and-ride lot with approximately 1,700 stalls would be provided near the Farrington Highway/North-South Road intersection. Feeder services between this planned station and major destinations on the UH West Oʻahu campus and the future D.R. Horton Development are expected. Easy pedestrian and bike access to the station are expected because of proximity to campus.
- Farrington Highway between North-South Road and Fort Weaver Road: The proposed station is located on vacant land makai of Farrington Highway approximately one-half mile ʻEwa of Old Fort Weaver Road. This station may serve the residents and visitors of the future D.R. Horton Development. Primary access to the station would be by vehicle. Easy pedestrian and bike access to the station are expected given the campus environment.

Alignment: Saratoga Avenue/North-South Road

This approximately 9.0-mile-long alignment provides access to eight possible stations, including the Kapolei Parkway and Hanua Street station. This alignment connects five major future development areas: the Kapolei development area bounded by Kamokila Boulevard, Fort Barrette Road, and Renton Road in Kapolei; the Kalaeloa Development; the DHHL Development; the campus for UH West Oʻahu; and the D.R. Horton Development. The seven proposed station sites besides the Kapolei Parkway and Hanua Street station are as follows:

- Kapolei Parkway and Wākea Street: The proposed Kapolei Parkway and Wākea Street station would be located on vacant land adjacent to the future Kapolei Parkway extension roadway Koko Head of Ulupia Street. The station designs include the development of the relocated Kapolei bus transit center. This station would have an elevated platform and mezzanine.
- Saratoga Avenue and Wākea Street: The proposed Saratoga Avenue and Wākea Street station would be located on the southeast corner of the Hornet Avenue/Saratoga Avenue intersection. This station would have an elevated platform and mezzanine. Vehicular access and transit would be the primary modes of access for this station. Construction of new roadways to connect to Saratoga Avenue may be required. Shuttle service between the station and Barbers Point Naval Air Station and John Rogers Field may be considered.
- Saratoga Avenue and Fort Barrette Road: The proposed Saratoga Avenue and Fort Barrette Road station would be located on the southeast corner of the Enterprise Street and Saratoga Avenue intersection. This station would have an elevated platform and mezzanine. Vehicular access and transit access would be the primary modes for this station. Shuttle services connecting nearby Barbers Point Naval Air Station and John Rogers Field and the industrial uses mauka of the Field may be considered.
- Kapolei Parkway and North-South Road: The proposed Kapolei Parkway and North-South Road station would be located on the southern end of the future DHHL

Development adjacent to North-South Road mauka of Roosevelt Road. Vehicular access would be the primary mode of access to this station. However, easy bike access to this station is expected with the proposed bike lane facility on the future North-South Road.

- North-South Road between Kapolei Parkway and Farrington Highway: The proposed station would be located on the southern end of the new UH West O'ahu campus, adjacent to the future DHHL Development. This station would be elevated and have a mezzanine. Feeder services between this planned station and major destinations on the UH West O'ahu campus and the future DHHL Development are expected. Easy pedestrian and bike access to the station are expected given its proximity to campus and the proposed bike lane on North-South Road.
- Farrington Highway and North-South Road: The proposed Farrington Highway and North-South Road station would be located on the northeast corner of the future campus site for UH West O'ahu. This station would be elevated and have a mezzanine. A park-and-ride lot with approximately 1,700 stalls would be provided near the North-South Road/Farrington Highway intersection. Feeder services between this planned station and major destinations on the UH West O'ahu campus and the future D.R. Horton Development are expected. Easy pedestrian and bike access to the station are expected given the proximity to the campus and potential TOD adjacent to the campus.
- Farrington Highway between North-South Road and Fort Weaver Road: The proposed station is located on vacant land makai of Farrington Highway approximately one-half mile 'Ewa of Old Fort Weaver Road. This station may serve the residents and visitors of the future D.R. Horton Development. Primary access to the station would be by vehicle. Easy pedestrian and bike access to the station are expected given the campus environment.

<u>Alignment: Geiger Road/Fort Weaver Road</u>

This approximately 8.9-mile-long alignment provides access to seven possible stations, including the Kapolei Parkway and Hanua Street station. This alignment connects several existing communities and future development areas: the future Kapolei development area bounded by Kamokila Boulevard, Fort Barrette Road, and Renton Road in Kapolei; the future Kalaeloa Development; the industrial uses mauka of the Barbers Point Golf Course; and residential neighborhoods along Fort Weaver Road. The six proposed station sites besides the Kapolei Parkway and Hanua Street station are as follows:

- Kapolei Parkway and Wākea Street: The proposed Kapolei Parkway and Wākea Street station would be located on vacant land adjacent to the future Kapolei Parkway extension roadway Koko Head of Ulupia Street. The station designs include the development of the relocated Kapolei bus transit center. This station would have an elevated platform and mezzanine.
- Saratoga Avenue and Wākea Street: The proposed Saratoga Avenue and Wākea Street station would be located on the southeast corner of the Hornet Avenue/Saratoga Avenue intersection. This station would have an elevated platform and mezzanine. Vehicular access and transit access would be the primary modes of access to this station. Construction of new roadways to connect to Saratoga Avenue may be required. Shuttle service between the station and the Barbers Point Naval Air Station and John Rogers

Field may be considered given that they are approximately one-quarter mile makai of this station.

- Saratoga Avenue and Fort Barrette Road: The proposed Saratoga Avenue and Fort Barrette Road station would be located on the southeast corner of the Enterprise Street and Saratoga Avenue intersection. This station would have an elevated platform and mezzanine. Vehicular access and transit access would be the primary modes for this station. Shuttle services connecting nearby Barbers Point Naval Air Station and John Rogers Field and the industrial uses mauka of the Field may be considered.
- North-South Road and Kapolei Parkway: The proposed North-South Road and Kapolei Parkway station would be located on vacant land ‘Ewa of Corregidor Street and makai of Vinson Street. This station would have easy vehicular access because of opportunities for a park-and-ride lot in the vicinity of this station near Bauer Road (approximately 1,650 parking stalls).
- Fort Weaver Road and Geiger Road: The proposed Fort Weaver Road and Geiger Road station would be located on Geiger Road ‘Ewa of Fort Weaver Road, serving primarily residential neighborhoods. With the proximity to the existing bike path on Geiger Road and Fort Weaver Road, easy bike access to this station is expected. However, vehicular access may be poor given the constrained geometry of the adjacent roadways and the consumption of right-of-way for widening Geiger Road to accommodate construction of a median for future column placement for elevated tracks and platform. As a result, little room is available to accommodate the ingress and egress of transit buses and kiss-and-ride.
- Fort Weaver Road and Renton Road: The proposed Fort Weaver Road and Renton Road station would be located on Fort Weaver adjacent to the O‘ahu Railway, serving primarily residential neighborhoods. This station is expected to have easy access for pedestrians, bike, and motorized modes. Opportunities for ingress and egress of transit buses and a 1,800-stall park-and-ride lot are available.

Section 2: Fort Weaver Road to Aloha Stadium

Only one alignment option is proposed in Section 2, traveling primarily along Farrington Highway and Kamehameha Highway. One potential maintenance and storage yard, Waiawa Site, has been identified in this section in several currently vacant sites near Kamehameha Highway in the vicinity of Leeward Community College.

Alignment: Farrington Highway/Kamehameha Highway

This alignment option serves five possible stations. The following describes the level of access for appropriate modes to the proposed stations.

- Farrington Highway and Leokū Street: This station would be well connected by roads and would have an elevated platform and mezzanine. Existing uses around the station are primarily commercial. Consideration should be given to providing safe pedestrian and bike routes between the station and the intersection of Farrington Highway and Leokū Street. This station would have a high level of transit bus interface.
- Farrington Highway and Mokuola Street: This station would primarily serve the Waipahu communities. An elevated platform and a mezzanine are under consideration

for the station design. With the proximity to the existing Waipahu transit center, easy pedestrian and bike access is expected, as well as a high level of bus access.

- Leeward Community College: The proposed Leeward Community College station would be located on the northern end of the college makai of Ala Iki Street and would be elevated. A potential maintenance yard near Kamehameha Highway is in the vicinity of this station. Connection of campus shuttles between this planned station and other campus buildings are expected. Consideration should be given to providing safe pedestrian and bike routes from major campus destinations and this station.
- Kamehameha Highway and Kuala Street: This station would be well connected by roads and would have an elevated platform and mezzanine. Existing uses around the station are primarily commercial and residential neighborhoods mauka of Kamehameha Highway. A park-and-ride lot with approximately 1,500 stalls is proposed in the station vicinity. A direct access ramp from makai-bound H-2 Freeway would be provided into the station park-and-ride lot to allow convenient access for transit buses and park-and-ride automobile access. A possible combination of the Leeward Community College station and the Kamehameha Highway and Kuala Street station in a location straddling the H-1 Freeway may be investigated. The two station locations could be combined and shifted to straddle the H-1 Freeway to maximize the opportunity to serve both a proposed park-and-ride lot and transit riders from Leeward Community College. If the two stations are combined, easy conveyance of pedestrian and bike motorists may need to be provided.
- Kamehameha Highway and Kaonohi Street: The proposed fixed guideway station would be located at the intersection of Kamehameha Highway and Kaonohi Street ‘Ewa of the Pearlridge Center. Existing uses around this elevated station are primarily commercial. Due to the station construction, vehicular access at the Kamehameha Highway/Kaonohi Street intersection may be affected as a result of potential restriping or reconstruction of left-turn lanes affected by the modifications necessary for column placement. A bus transit center is planned makai of the intersection of Kamehameha Highway and Kanuku Street approximately 200 yards ‘Ewa of the planned fixed guideway station. Vehicular ingress and egress to the bus transit center could be obtained via the existing signal at Kanuku Street. Linkages of safe pedestrian routes and bike access should be integrated with the designs of both the fixed guideway station and the new bus transit center. A high level of bus access to this station is expected.

Section 3: Aloha Stadium to Middle Street

Four alignment options are proposed in Section 3, each originating at the junction of Salt Lake Boulevard and Kamehameha Highway ‘Ewa of the Aloha Stadium and continuing in varying routes ending in the vicinity of the Ke‘ehi Interchange and Middle Street. All stations would be well connected for vehicular access under all alignments. Each alignment option serves from two to four possible stations. The following describes each proposed station site for all alignment options:

<u>Alignment: Salt Lake Boulevard</u>

This approximately 4.8-mile-long alignment provides access to only two possible stations, serving primarily existing low-density and high-density residential uses along Salt Lake Boulevard.

- Salt Lake Boulevard and Kahuapa‘ani Street: The proposed fixed guideway station would be located in the median of Salt Lake Boulevard mauka of the H-1 Freeway. Existing uses immediately adjacent to the station are surface parking lots serving Aloha Stadium and commercial uses. A park-and-ride lot with approximately 1,300 stalls is proposed at this station. Further review is recommended regarding the feasibility of sharing the Aloha Stadium parking with future fixed guideway users. Provision of kiss-and-ride services at the existing surface parking lots for Aloha Stadium would conflict with the existing flea market. In addition, shuttle buses are envisioned from this station to Ford Island and the Arizona Memorial and could be provided by the U.S. Navy. Marked pedestrian crossings only exist on the east and west sides of Salt Lake Boulevard across Kahuapa‘ani Street. An elevated concourse to straddle Salt Lake Boulevard and safely convey pedestrians and bicyclists between the station and adjacent uses could be considered.
- Salt Lake Boulevard and Ala Inoi Place: The Salt Lake Boulevard and Ala Inoi Place station would be located on the makai side of Salt Lake Boulevard Koko Head of Arizona Road, in the vicinity of the Honolulu County Club. Existing uses in the immediate vicinity are residential on the makai side of Salt Lake Boulevard and mixed commercial and high-density residential on the mauka side of Salt Lake Boulevard. The topography makes pedestrian access between the high-density residential uses and the station difficult; thus, feeder services to circulate through the neighboring high-density residential uses in the area may be provided. Ala Lima Place could be extended to Salt Lake Boulevard to form a four-leg intersection with Arizona Road and provide bus, vehicle, and walk access to the fixed guideway station. The southeast corner of the Salt Lake Boulevard/Arizona Road intersection is currently vacant. Potential transit-oriented development associated with the station development could be considered for this vacant area.

The three other alignments in Section 3 extend from Aloha Stadium to the H-1 Freeway along Kamehameha Highway and continue in three different routes to the Ke‘ehi Interchange: mauka of the Airport Viaduct, makai of the Airport Viaduct, and along Aolele Street. The following describes the two common stations that serve these three alignments.

- Aloha Stadium: The proposed Aloha Stadium station would be located on the existing Aloha Stadium surface parking lot on the makai side of Kamehameha Highway mauka of Fort Island Boulevard. This station would be elevated and may have a mezzanine. Consideration should be given to the capacity of the station platform to accommodate the heavy pedestrian flows when stadium events occur. A park-and-ride lot with approximately 1,300 to 1,500 stalls is proposed at this station. Further review is recommended regarding the feasibility of sharing Aloha Stadium parking with future fixed guideway users. Provision of kiss-and-ride services at the existing surface parking lots for Aloha Stadium would conflict with the existing flea market. In addition, shuttle buses are envisioned from this station to Ford Island and the Arizona Memorial and could be provided by the U.S. Navy. Feeder services to circulate through the neighboring high-density residential uses in the area could be considered.

- Kamehameha Highway and Radford Drive: The proposed Kamehameha Highway and Radford Drive station would be located in the median of Kamehameha Highway mauka of Radford Drive. Although pedestrian crossings currently exist on all four legs of the Kamehameha Highway/Radford Drive intersection, an elevated conveyance or concourse for pedestrian and bike access to and from the station could be constructed to straddle Kamehameha Highway and to touch down on Navy property. Vehicular movement at the Kamehameha Highway/Radford Drive intersection may be limited because construction of the station may involve the restriping or reconstruction of the left-turn lanes affected by the modifications necessary for column placement in the medians.

Alignment: Mauka of the Airport Viaduct

This approximately 5.1-mile-long alignment provides access to three possible stations, including the two described above. The third station is described below.

- Nimitz Highway and Paiea Street: The proposed Nimitz Highway and Paiea Street Station would be located on vacant land on the mauka side of the H-1 Freeway ‘Ewa of Camp Catlin Road. Feeder services to circulate though the neighboring residential areas and to Honolulu International Airport are possible. An existing marked pedestrian crossing at the intersection of Nimitz Road and Camp Catlin Road may need upgrading or signaling, anticipating the increased pedestrian and bike flow to and from the station.

Alignment: Makai of the Airport Viaduct

This approximately 5.2-mile-long alignment provides access to four possible stations, including the aforementioned stations at Aloha Stadium and at Kamehameha Highway and Radford Drive. The other two stations are described below.

- Nimitz Highway and Aolele Street: This station would be located on vacant land on the makai side of the H-1 Freeway ‘Ewa of Aolele Street. Shuttles to connect the station and the airport’s interisland terminals and residential uses on the mauka side of the H-1 Freeway should be considered.
- Nimitz Highway and Lagoon Drive: This station would be located on the makai side of Nimitz Highway ‘Ewa of Lagoon Drive. With the constrained right-of-way, little room is available to accommodate bus transfers. Potential locations for bus bays along Nimitz Highway and under the H-1 Freeway require further investigation. Pedestrian traffic from commercial uses on the mauka side of the H-1 Freeway may be difficult. A high level of bus service connecting to the Salt Lake community would be provided. Circulators to connect the station to adjacent industrial buildings in the area and the airport’s interisland terminals may be considered.

Alignment: Aolele Street

This approximately 5.4-mile-long alignment provides access to four possible stations, including the aforementioned stations at Aloha Stadium and at Kamehameha Highway and Radford Drive. The other two stations are described below.

- Honolulu International Airport: The proposed Honolulu International Airport station would be located on airport property. Shuttles to connect the station and the airport's interisland terminals should be considered, as well as convenient pedestrian linkages. No room is available to accommodate bus transfers at this station.
- Aolele Street and Lagoon Drive: This station would be located on the mauka side of Aolele Street ‘Ewa of Lagoon Drive. Shuttles to circulate through the industrial area and the airport's interisland terminals should be considered. No room is available at the station site to accommodate bus transfers. A potential transit station could be located on adjacent airport property on the makai side of Aolele Street ‘Ewa of Lagoon Drive. Existing marked pedestrian crossings only exist on the Makai and ‘Ewa bound legs of the Aolele Street/Lagoon Drive intersection. Sidewalks and crossings should be installed or upgraded anticipating the increased pedestrian and bike flow to and from the station. Vehicular access at Aolele Street may be limited because existing free-flow right-turn lanes may be reconfigured as a result of column placement for the station. A high level of bus service connectivity to the Salt Lake community would also be provided at this station.

Section 4: Middle Street to Iwilei

Two alignment options are proposed in Section 4, each beginning at the Ke‘ehi Interchange and continue in varying routes via either North King Street or Dillingham Boulevard ending in Iwilei. The following describes each proposed station site:

<u>Alignment: North King Street</u>

This approximately 2.3-mile-long alignment provides access to three possible stations. The following describes the level of access for appropriate modes for each station:

- Middle Street Transit Center: The proposed Middle Street Transit Center station for this alignment would be located on the Koko Head side of Middle Street approximately 100 yards makai of North King Street. This station would serve the alignment connecting the airport alignments within the North King Street alignment. There may be loss of on-street parking along the makai curb of Middle Street as a result of station construction. With the proximity to the H-1 Freeway, Nimitz Highway, and King Street, vehicular access would be a focus of this station, with particular emphasis on bus transit connections. With the proximity to the proposed the bike facility on Middle Street, bike access to this station is also expected. However, because of the industrial-oriented environment and the multiple freeway interchanges in the station vicinity, this station may not provide an appealing experience for pedestrians walking to and from the station.
- North King Street and Owen Street: The proposed North King Street and Owen Street station would be located on the makai side of North King Street Koko Head of Owen Street. This station would only serve the alignment connecting a Salt Lake Boulevard route with North King Street. The Middle Street Transit Center would be relocated to the site if this route were chosen. Industrial and commercial buildings and surface parking currently surround the station site. With the proximity to the H-1 Freeway, Nimitz Highway, and King Street, vehicular access would be a focus of this station, with

particular emphasis on bus transit access. With the proximity to the proposed bike facility on Middle Street and King Street, bike access to this station is also expected. Shuttles should be considered for circulation through the adjacent industrial and residential uses in the area. Pedestrian and bike access from the station to the residential and commercial uses on the mauka side of the H-1 Freeway may be difficult.

- North King Street and Waiakamilo Street: This station would be located on the mauka side of North King Street ‘Ewa of Waiakamilo Road/Houghtailing Street. This station would be well connected by roads and would be elevated with a mezzanine. The existing use on the station site is a surface parking lot. High-density residential neighborhoods and educational institutions currently surround the station. On-street parking on the mauka side of North King Street may be restricted as a result of column placement for the station platform. Easy pedestrian and bike access may be expected at this station.

<u>Alignment: Dillingham Boulevard</u>

This approximately 1.8-mile-long alignment provides access to three possible stations, which are described below.

- Middle Street Transit Center: The proposed Middle Street Transit Center station for this alignment would be located in the median of Kamehameha Highway (Dillingham Boulevard) adjacent to Kalihi Stream. Existing uses in the immediate vicinity of the station site are primarily commercial or industrial. Potential park-and-ride lots or structures in the station vicinity could be developed and shared with other adjacent uses. With the proximity to the H-1 Freeway, Nimitz Highway, and King Street, vehicular access would be a focus of this station, with particular emphasis on bus transit access. With the proximity to the proposed bike facility on Middle Street and Dillingham Boulevard, bike access to this station is also expected. However, given the industrial-oriented environment and the multiple freeway interchanges in the station vicinity, this station may not provide an appealing experience for pedestrians walking to and from the station. Pedestrian and bike access from the station to industrial uses on the makai side of Kamehameha Highway may need to be constructed.
- Dillingham Boulevard and Mokauea Street: This station would be located in the median of Dillingham Boulevard between Pu‘uhale Road and Mokuaea Street, adjacent to a currently vacant area. Existing uses in the immediate vicinity of the station site are primarily residential or commercial. Feeder buses to circulate through the high-density residential neighborhoods may be considered. Existing buses stop in traffic lanes while loading and unloading passengers and may need to continue similar operations given the constrained right-of-way of Dillingham Boulevard with the elevated fixed guideway structure.
- Dillingham Boulevard and Kōkea Street: This station would be located in the median of Dillingham Boulevard between Pu‘uhale Road and Mokauea Street, near Kapālama Stream. The construction of the station and column placement for the elevated fixed guideway tracks may permanently restrict left turns or u-turns at the Dillingham Boulevard/Kōkea Street intersection, affecting vehicular circulation to and from commercial uses along Kōkea Street. Feeder buses to circulate through adjacent commercial areas may be considered. No pedestrian crossings are provided at the

Dillingham Boulevard/Kōkea Street intersection. Safe pedestrian and bike access routes need to be included in the provision of future pedestrian and bike flow to and from the station.

Section 4 to Section 5 Connections

Several alignments are proposed for connections between the two possible Section 4 alignments and the possible Section 5 alignments. These connector alignments are considered part of Section 5. Only one fixed guideway station would be built depending on the selected connection. Four optional locations are considered for this station depending on the connection alternatives:

- North King Street at Dillingham Boulevard and Liliha Street: This would be the station for the alignment connecting the North King Street Alignment in Section 4 to the Beretania Street/South King Street Alignment, the King Street/Waimanu Street/Kapi‘olani Boulevard Alignment, and the Hotel Street/Kawaiaha‘o Street/Kapi‘olani Boulevard Alignment in Section 5. This station would be located on the mauka side of North King Street mauka of Liliha Street. This station would be well-connected by roads and be elevated with a mezzanine. High-density residential neighborhoods and commercial uses are in the immediate vicinity. On-street parking on the mauka side of North King Street would be affected by column placement for this station. Existing express buses that currently travel through this area to obtain access to the H-1 Freeway to Downtown Honolulu may be modified or turned back at this location once the fixed guideway system is built. The bus transfers and vehicular volumes at the North King Street/Liliha Street intersection may therefore be reduced. Physical intersection improvements at the King Street/Liliha Street intersection may be needed to facilitate non-motorized movements and vehicular flow to and from the station.
- Ka‘aahi Street Station Option 1: This would be the station connecting the North King Street Alignment in Section 4 to the Nimitz Highway/Halekauwila Street/Kapi‘olani Boulevard Alignment and the Nimitz Highway/Queen Street/Kapi‘olani Boulevard Alignment in Section 5. The station would be located on private property on the makai side of King Street near Liliha Street. Given its proximity to Nimitz Highway and King Street, vehicular access may the primary focus of this station, which would be elevated and have a mezzanine. The station may be developed as an intermodal transit center for buses and the proposed fixed guideway. Poor pedestrian access may be expected in the station vicinity because sidewalks are not continuous. Pedestrian and bike linkages between Dillingham Boulevard and the Ka‘aahi Station may need to be improved.
- Ka‘aahi Street Station Option 2: This would be the station for the alignment connecting the Dillingham Boulevard Alignment in Section 4 to the Nimitz Highway/Halekauwila Street/Kapi‘olani Boulevard Alignment and the Nimitz Highway/Queen Street/Kapi‘olani Boulevard Alignment in Section 5. The station would be located on Ka‘aahi Street at Kaamuhu Place and would be elevated and have a mezzanine. On-street parking on both sides of Ka‘aahi Street may be removed. Given its proximity to Nimitz Highway and King Street, vehicular access may the primary focus of this station. This station may be developed as an intermodal transit center for buses and the proposed fixed guideway. Poor pedestrian access may be expected in the vicinity because sidewalks are not

continuous. Pedestrian facilities in the area should be improved to provide adequate pedestrian access to the station.

- Ka‘aahi Street Station Option 3: This would be the station for the alignment connecting the Dillingham Boulevard Alignment in Section 4 to the Beretania Street/South King Street Alignment, the King Street/Waimanu Street/Kapi‘olani Boulevard Alignment, and the Hotel Street/Kawaiaha‘o Street/Kapi‘olani Boulevard Alignment in Section 5. The station would be located on private property near the intersection of King Street and Iwilei Road and would be elevated and have a mezzanine. Given its proximity to Nimitz Highway and King Street, vehicular access may the primary focus of this station. This station may be developed as an intermodal transit center for buses and the proposed fixed guideway. Poor pedestrian access may be expected in the vicinity because sidewalks are not continuous. Pedestrian facilities in the area should be improved to provide adequate pedestrian access to the station.

Section 5: Iwilei to UH Mānoa

Five alignment options and one spur route to Waikīkī are proposed in Section 5, each beginning at Iwilei and continuing in varying routes ending at UH Mānoa. Each alignment option would serve between eight and 12 possible stations, including the station on the connector alignment between Section 4 and Section 5 The Waikīkī Branch alignment would serve three stations. Except for the Waikīkī Branch, all alignments would provide service to UH Mānoa with stops at the University Avenue and South King Street station and the UH Lower Campus station. The following describes the two stations common to each alignment:

- University Avenue and South King Street: This station would be located on University Avenue mauka of King Street, would be well-connected by roads, and be elevated with a mezzanine. The mezzanine would provide an improved link for pedestrians across University Street. The proposed street reconfiguration to install columns for the station may involve eliminating an existing bus pullout on the east side of University Avenue mauka of King Street, resulting in in-lane bus stops that could block traffic. Even though there may be no loss of lanes, this intersection is a major bus transfer location for buses coming from the east. Vehicular movement at the University Avenue/King Street intersection would be limited because the column placement of the station may also involve the restriping or reconstruction of left-turn lanes affected by modifications necessary for column placement. Connection services between this station and major campus destinations are expected, as is easy pedestrian and bike access in the vicinity.
- UH Lower Campus: The planned UH Lower Campus station would be located on the makai side of Lower Campus Road. This station, which may be elevated, would be a pedestrian and bike-oriented station. Given the constrained right-of-way of Lower Campus Road, column placement for the station may occupy most of the roadway and block through traffic on Lower Campus Road and access to adjacent campus buildings. Connection services between this station and major campus destinations are expected in future planning of campus shuttle or circulator routes. Bike access and bike parking around the station would be needed. Pedestrian paths are well-connected in the vicinity.

The following describes the other stations along each alignment option of Section 5:

Alignment: Beretania Street/South King Street

This approximately 4.0-mile-long alignment provides access to eight possible stations, including the above-described University Avenue and South King Street and UH Lower Campus stations and the Ka‘aahi Street station or North King Street at Liliha Street station on the connector alignment between Section 4 and Section 5. The following describes the remaining five stations along this alignment:

- Beretania Street and Fort Street Mall: The proposed Beretania Street and Fort Street Mall station would be an underground station serving primarily the Fort Street Mall and adjacent commercial development. Because of its Downtown location, this station would only provide pedestrian and bike access. No kiss-and-ride or transit transfer facility would be constructed onsite. Feeder buses to circulate in the adjacent commercial area are expected. Safe pedestrian and bike access routes need to be included for future pedestrian and bike flow to and from the station.
- Beretania Street and Alapa‘i Street: This station would be located on an existing surface parking lot on the makai side of King Street Koko Head of Alapa‘i Street and would have an elevated platform. This station is well-connected by roads. The existing surface parking lot may be developed as an intermodal transit center for both buses and fixed guideway service. The existing pedestrian crosswalk at the intersection of King and Cooke Streets may need to be improved in anticipation of increased foot and bike traffic from the adjacent uses to the station. This station is expected to have bike access, given the proximity to proposed bike facilities on both King and McCully Streets.
- King Street and Pensacola Street: The King Street and Pensacola Street station would be located on the makai side of King Street ‘Ewa of Pensacola Street and would have an elevated platform with a mezzanine level. On-street parking and the peak-period travel lane related to the parking lane along the makai curb of King Street would be removed because of column placement for the station platform. Several vacant land sites in the immediate vicinity of the station may be candidates for potential transit-oriented development sites. This station is expected to have bike access given its proximity to the proposed bike facility on both King and McCully Streets. Safe pedestrian and bike access routes need to be included in the provision of future pedestrian and bike flow to and from the station.
- South King Street and Kalākaua Avenue: The South King Street and Kalākaua Avenue station would be located on the makai side of South King Street between Kalākaua Avenue and Punahou Avenue. This station would have an elevated platform with a mezzanine level. On-street parking and the peak-period travel lane related to the parking lane along the makai curb of King Street would be removed for column placement. This station is well-connected by roads, with pedestrian crossings installed on all legs at the adjacent intersections. This station is expected to have bike access, given its proximity to the proposed bike facilities on both King and McCully Streets.
- South King Street and McCully Street: The proposed South King Street and McCully Street station would be located on the makai side of King Street across Wiliwili Street. This station would have an elevated platform with mezzanine. On-street parking and the peak-period travel lane related to the parking lane along the makai curb of South King Street would be removed for column placement. Vehicular access to the existing

commercial buildings and surface parking lots on both sides of Wiliwili Street may be affected as a result of column placement. The pedestrian crosswalk at the intersection of King and Wiliwili Streets may need to be improved in anticipation of increased foot and bike traffic. This station is expected to have bike access, given its proximity to the proposed bike facilities on both King and McCully Streets. Safe pedestrian and bike access routes need to be included for future pedestrian and bike flow to and from the station.

Alignment: King Street/Waimanu Street/Kapiʻolani Boulevard

This approximately 4.6-mile-long alignment provides access to nine possible stations. Three of the nine stations along this alignment are common to the other alignments in Section 5: the above-mentioned University Avenue and South King Street and UH Lower Campus stations and the Kaʻaahi Street station or the North King Street at Liliha Street station on the connector alignment between Section 4 and Section 5.. The remaining six stations are as follows:

- King Street and Bethel Street: This station would be underground between Fort Street Mall and Bishop Street. Given its Downtown location, this station would only provide pedestrian and bike access. No kiss-and-ride or transit transfer facility would be constructed onsite. Feeder buses to circulate in the adjacent commercial areas are expected.
- King Street and Kapiʻolani Boulevard: This station would be underground adjacent to the intersection of King Street and Kapiʻolani Boulevard. It would provide primarily pedestrian and bike access, although transfers from/to bus transit are expected.
- Waimanu Street and Cummins Street: This station would be at-grade, located on Waimanu Street Koko Head of Ward Avenue. On-street parking along Waimanu Street may be removed, thereby reducing vehicular access to the station. This station would provide primarily pedestrian and bike access, although transfers from/to bus transit are also expected.
- Ala Moana Center: The Al Moana Center station would be located in the median of Kona Street between Kona Iki and Keʻeaumoku Streets. This station would be elevated with a mezzanine. This station would provide easy access to transit transfers and non-motorized modes, including the existing bus transfer center at Ala Moana Center. The amount of bus transit service focused on this location would make Ala Moana an intermodal transit center for both buses and fixed guideway service.
- Kapiʻolani Boulevard and McCully Street: This station would be located in the median of Kapiʻolani Boulevard adjacent to Ala Wai Community Park. Construction may require a new median along Kapiʻolani Boulevard and result in restriction of left-turn access to driveways along Kapiʻolani Boulevard. The existing marked pedestrian crossing at the Kapiʻolani Boulevard and Wiliwili Street intersection may need to be improved or signalized. This location would be a major transfer point for buses to Waikīkī. Access and egress from this station would be primarily by walking, cycling, or bus.
- University Avenue and Date Street: The planned University Avenue and Date Street station would be located on University Avenue adjacent to Date Street. This station would be well-connected by roads and would be elevated with a mezzanine. Column

placement of the station may involve restriction of left-turn movements from University Avenue to Date Street. Access and egress from this station would be primarily by walking, cycling, or bus, although some kiss-and-ride activity is also expected. Bus bays would be provided so buses serving east Honolulu can interface with the fixed guideway system.

<u>Alignment: Hotel Street/Kawaiahaʻo Street/Kapiʻolani Boulevard</u>

This approximately 4.6-mile-long alignment provides access to 12 possible stations. Three of the 12 stations are common to the other alignments in Section 5, including the above-mentioned University Avenue and South King Street and UH Lower Campus stations and the Kaʻaahi Street station or North King Street at Liliha Street station on the connector alignment between Section 4 and Section 5. The following describes the remaining nine stations along the alignment:

- Hotel Street and Kekaulike Street: This station would be at-grade on Hotel Street between River and Maunakea Streets. Because of its Downtown location, this station would primarily provide pedestrian and bike access. No kiss-and-ride or transit transfer facilities would be constructed onsite. Feeder buses would circulate in adjacent commercial areas. Pedestrian circulation across Hotel Street in the vicinity of the station could be blocked because of train length when trains are stopped at the station. The station and the fixed guideway may occupy the majority of the roadway space on Hotel Street. Consideration should be given to pedestrian safety during peak-period train operations.
- Hotel Street and Nuʻuanu Avenue: This station would be at-grade on Hotel Street between Smith Street and Nuʻuanu Avenue. Because of its Downtown location, this station would provide primarily pedestrian and bike access. No kiss-and-ride or transit transfer facilities would be constructed onsite. Feeder buses would circulate in adjacent commercial areas. Pedestrian circulation on Hotel Street in the vicinity of the station may be blocked because of train length when trains are stopped at the station. The station and the fixed guideway may occupy the majority of the roadway space on Hotel Street. Consideration should be given to pedestrian safety during peak-period train operations
- Hotel Street and Fort Street Mall: The proposed Hotel Street and Fort Street Mall station would be at-grade on Hotel Street between Fort Street Mall and Bishop Street. Because of its Downtown location, this station would provide primarily pedestrian and bike access, although transfers from/to bus transit are also expected. No kiss-and-ride or transit transfer facilities would be constructed onsite. Feeder buses would circulate in adjacent commercial areas. The station and the fixed guideway tracks may occupy the majority of the roadway space on Hotel Street. Consideration should be given to pedestrian safety along Hotel Street and at the Hotel Street and Bishop Street intersection during peak-period train operations.
- Honolulu Hale Station: The proposed Honolulu Hale station would be underground adjacent to the Likelike Mall near Punchbowl Street. This station may only provide pedestrian and bike access. No kiss-and-ride or transit transfer facilities would be constructed onsite. A marked pedestrian crossing currently exists on Punchbowl Street and may need improvement in anticipation of increased foot traffic to the station.

- Kawaiahaʻo Street and Cooke Street: The proposed Kawaiahaʻo Street and Cooke Street station would be located on the makai side of Kawaiakao Street Koko Head of Cooke Street and would be elevated. On-street parking along the makai curb of Kawaiahaʻo Street may be removed for column placement. A new marked pedestrian crosswalk may need to be installed on the only leg without one as a result of increased foot traffic along Kawaiahaʻo Street across Cooke Street to the station. New or improved sidewalks may be needed along Kawaiahaʻo Street.
- Kawaiahaʻo Street and Kamakeʻe Street: This station would be located on private property on the mauka side of Waimanu Street and would have an elevated platform. On-street parking along the mauka side of Waimanu Street may be removed for column placement. This station would primarily provide pedestrian and bike access. New or improved sidewalks may be needed along Waimanu Street.
- Ala Moana Center: The Al Moana Center station would be located in the median of Kona Street between Kona Iki and Keʻeaumoku Streets. This station would be elevated with a mezzanine. This station would provide easy access to transit transfers and non-motorized modes, including the existing bus transfer center at Ala Moana Center. The amount of bus transit service focused on this location would make Ala Moana an intermodal transit center for both buses and fixed guideway service.
- Kapiʻolani Boulevard and McCully Street: This station would be located in the median of Kapiʻolani Boulevard adjacent to Ala Wai Community Park. Construction of McCully Station may require a new median along Kapiʻolani Boulevard and may result in restriction of left-turn access to driveways along Kapiʻolani Boulevard. The existing marked pedestrian crossing at the Kapiʻolani Boulevard and Wiliwili Street intersection may need to be improved or signalized. This location would be a major transfer point for buses to Waikīkī. Access and egress from this station would be primarily by walking, cycling, or bus.
- University Avenue and Date Street: This station, located on University Avenue adjacent to Date Street, would be well-connected by roads and be elevated with a mezzanine. Column placement for the station may involve restriction of left-turn movements from University Avenue to Date Street. Access and egress from this station would be primarily by walking, cycling, or bus, although some kiss-and-ride activity is also expected. Bus bays would be provided so buses serving east Honolulu can interface with the fixed guideway system.

<u>Alignment: Nimitz Highway/Queen Street/Kapiʻolani Boulevard</u>

This approximately 4.6-mile-long alignment provides access to 10 possible stations. Three of the 10 stations are common to the other alignments in Section 5, including the above-described University Avenue and South King Street and UH Lower Campus stations and the Kaʻaahi Street station or North King Street at Liliha Street station on the connector alignment between Section 4 and Section 5. The following describes the remaining seven stations along the alignment:

- Nimitz Highway and Kekaulike Street: This station would be on the existing median on Nimitz Highway between River and Kekaulike Streets. It would be designed so as to provide convenient access to both motorized (including buses) and non-motorized modes.

A marked pedestrian crossing currently exists on Nimitz Highway at Kekaulike Street. This station may provide easy access to both motorized and non-motorized modes.

- Queen Street and Fort Street Mall: This station would be on the makai side of Queen Street between Fort Street and Bishop Street and would be elevated. This station would primarily serve pedestrians and bikes from the Fort Street Mall. Because of the constrained right-of-way on Queen Street, an ‘Ewa-bound lane and a parking lane could be removed for column placement.
- Queen Street and South Street: This station would be on the makai side of Queen Street between Mission Lane and South Street and would be elevated. It would provide easy access for pedestrians and bikes. Because of the constrained right-of-way on Queen Street, an ‘Ewa-bound lane and a parking lane could be removed for column placement. Vehicular access to Mission Lane could be restricted as a result of column placement.
- Queen Street and Cummins Street: This station would be on the makai side of Queen Street between Cummins Street and Kamake‘e Street and would be elevated. This station may be a pedestrian-oriented station. Because of the constrained right-of-way on Queen Street, an ‘Ewa-bound lane and a parking lane could be removed for column placement. Construction of this station may result in restriction of left-turn access to driveways along Queen Street. New or improved sidewalks may be needed along Queen Street in the vicinity of the station to enhance pedestrian access.
- Ala Moana Center: The Al Moana Center station would be located in the median of Kona Street between Kona Iki and Ke‘eaumoku Streets. This station would be elevated with a mezzanine. It would provide easy access to transit transfers and non-motorized modes, including the existing bus transfer center at Ala Moana Center. The amount of bus transit service focused on this location would make Ala Moana an intermodal transit center for both buses and fixed guideway service.
- Kapi‘olani Boulevard and McCully Street: This station would be located in the median of Kapi‘olani Boulevard adjacent to Ala Wai Community Park. Construction may require a new median along Kapi‘olani Boulevard and may result in restriction of left-turn access to driveways along Kapi‘olani Boulevard. The existing marked pedestrian crossing at the Kapi‘olani Boulevard and Wiliwili Street intersection may need to be improved or signalized. This location would be a major transfer point for buses to Waikīkī. Access and egress from this station would be primarily by walking, cycling, or bus.
- University Avenue and Date Street: This station would be located on University Avenue adjacent to Date Street. It would be well-connected by roads and would be elevated with a mezzanine. Column placement of the station may involve restriction of left-turn movements from University Avenue to Date Street. Access and egress from this station would be primarily by walking, cycling, or bus, although some kiss-and-ride activity is expected to occur. Bus bays would be provided so buses serving east Honolulu can interface with the fixed guideway system.

<u>Alignment: Nimitz Highway/Halekauwila Street/Kapi‘olani Boulevard</u>

This approximately 4.7-mile-long alignment provides access to 10 possible stations. Three of the 10 stations are common to the other alignments in Section 5, including the above-described University Avenue and South King Street and UH Lower Campus stations and the Ka‘aahi Street station or North King Street at Liliha Street station on the connector alignment between Section 4 and Section 5. The following describes the remaining seven stations along the alignment.

- Nimitz Highway and Kekaulike Street: This station would be located on the existing median on Nimitz Highway between River and Kekaulike Streets and would be elevated with a mezzanine. This station may provide easy bike access given its proximity to the existing bike path on Nimitz Highway. A marked pedestrian crossing currently exists on Nimitz Highway at Kekaulike Street. This station would provide access to both motorized (especially buses) and non-motorized modes.
- Nimitz Highway and Fort Street Mall: This station would be in the median of Nimitz Highway at Bishop Street and would be elevated. It may provide easy bike access given its proximity to the existing bike path on Nimitz Highway. A marked pedestrian crossing currently exists on Nimitz Highway at Bishop Street. The surface parking field on the makai side of Nimitz Highway serving Aloha Tower could be a transit center location or be used for transit-oriented development.
- Halekauwila Street and South Street: This station would be on the makai side of Halekauwila Street between South and Keawe Streets and would be elevated. It may provide easy pedestrian and bike access given its proximity to the existing bike path on Nimitz Highway. Because of the constrained right-of-way on Halekauwila Street, an ‘Ewa-bound lane and the parking lane along the makai side of Halekauwila Street may be removed for column placement. Pedestrian crossings may need to be installed at the intersection of Halekauwila Street and Keawe Street to facilitate foot traffic to the station.
- Halekauwila Street and Ward Avenue: This station would be located on private property on the makai side of Halekauwila Street. It would have an elevated platform and be well-connected by roads. New or improved sidewalks may be needed along Halekauwila Street in the vicinity of the station. This station would provide primarily pedestrian and bike access, although transfers from/to bus transit are also expected.
- Ala Moana Center: The Al Moana Center station would be located in the median of Kona Street between Kona Iki and Ke‘eaumoku Streets. This station would be elevated with a mezzanine. It would provide easy access to transit transfers and non-motorized modes, including the existing bus transfer center at Ala Moana Center. The amount of bus transit service focused on this location would make Ala Moana an intermodal transit center for both buses and fixed guideway service.
- Kapi‘olani Boulevard and McCully Street: This station would be located in the median of Kapi‘olani Boulevard adjacent to Ala Wai Community Park. Construction may require a new median along Kapi‘olani Boulevard and may result in restriction of left-turn access to driveways along Kapi‘olani Boulevard. The existing marked pedestrian crossing at the Kapi‘olani Boulevard and Wiliwili Street intersection may need to be improved or signalized. This location would be a major transfer point for buses to Waikīkī. Access and egress from this station would be primarily by walking, cycling, or bus.
- University Avenue and Date Street: This station would be located on University Avenue adjacent to Date Street. It would be well-connected by roads and would be elevated with a mezzanine. Column placement of the station may involve restriction of left-turn movements from University Avenue to Date Street. Access and egress from this station would be primarily by walking, cycling, or bus, although some kiss-and-ride activity is

also expected. Bus bays would be provided so buses serving east Honolulu can interface with the fixed guideway system.

Alignment: Waikīkī Branch

This approximately 1.5-mile-long alignment would provide access to three possible stations, described below.

- Convention Center from Kalākaua Avenue: This station would be located on the mauka side of Kalākaua Avenue near Ala Wai Boulevard. Construction may result in removal of one ʻEwa-bound travel lane. Consideration should be given to reducing conflicts between increased pedestrian volumes to and from the station and the vehicular movement on Kalākaua Avenue and Ala Wai Boulevard.
- Kūhiō Avenue and Kālaimoku Street: This station would be located on the mauka side of Kūhiō Avenue at Launiu Street. Construction may result in removal of one ʻEwa-bound travel lane for column placement. This station would provide easy access for pedestrians.
- Kūhiō Avenue and Liliʻuokalani Avenue: This station would be located on the mauka side of Kūhiō Avenue between Liliʻuokalani and ʻŌhua Avenues. Construction may result in removal of one ʻEwa-bound travel lane and the parking lane for column placement. This station would provide easy access for pedestrians, as well as on-street transfers to buses.